104

FY 1997 NASA POSTURE HEARING

Y 4. SCI 2: 104/51

FY 1997 NASA Posture Hearing, (No....

HEARING

BEFORE THE

SUBCOMMITTEE ON SPACE AND AERONAUTICS

OF THE

COMMITTEE ON SCIENCE

U.S. HOUSE OF REPRESENTATIVES

ONE HUNDRED FOURTH CONGRESS

SECOND SESSION

MARCH 28, 1996

[No. 51]

Printed for the use of the Committee on Science

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*Ranking Minority Member
**Vice Chairman

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FY 1997 NASA POSTURE HEARING

THURSDAY, MARCH 28, 1996

U.S. House of Representatives,
Committee on Science,
Subcommittee on Space and Aeronautics,
Washington, DC.

The subcommittee met at 1:05 p.m. in Room 2318 of the Rayburn House Office Building, the Honorable F. James Sensenbrenner, Jr., chairman of the subcommittee, presiding.

Mr. Sensenbrenner. The Subcommittee will be in order.

Without objection, the Chair asks unanimous consent to declare recesses when the House is voting this afternoon.

We should be able to have a couple of extended periods of time without being interrupted by roll calls, but we do need to have this permission in order to have everything flow properly. So without objection, permission is granted.

Last year, NASA Administrator Dan Goldin said the budget resolution passed by Congress put us on the road to disaster. We were encouraged last year to believe that the President's budget through the year 2,000 was the lowest possible level which still maintained NASA's space leadership.

This year, however, the President has offered a budget for NASA which contains $3 billion in cuts below last year's "lowest possible level."

Unfortunately, the President's budget provides little detail about how to make these cuts. The specifics were left to NASA.

Yet if Congress looks to the NASA budget request, NASA's numbers don't match the Presidents. Apparently there are two sets of books for this budget. What's missing is a roadmap on how to get the job done.

And I guess the tough choices will again be left to Congress.

Last year, the Congress set priorities and made hard decisions that the American people expected. The White House called as potted plants, but we put NASA on a budget path that carried all of its major programs forward in this tight fiscal climate. We made the tough calls.

The year, the White House sent forward a make believe budget that makes no sense. We've prepared a chart, which is over on that side of the room, that describes the current state of affairs.

The dashed red line on the top of the chart is OMB's budget for NASA. It declines to $11.6 billion in fiscal year 2,000. You can see this in a V-shaped curve at the top of the chart.

The areas in color show NASA's projection of its budget based on what it takes to carry out the programs in the President's fiscal year 1997 budget.

That budget reaches $13.2 billion in fiscal 2,000.

The difference between NASA and OMB budgets total more than $3.5 billion between now and the year 2001.

The President set five priorities for the future of America's civilian space program. OMB established these priorities which are contained in the safe zone toward the bottom of the chart and include first, Mission to Planet Earth, second the space station, third, high performance computing and communications, fourth, high speed research and advanced subsonic technologies in the aeronautics account, and fifth, the new millennium initiative.

Space science is not on the President's priority list so it's presented at the top of the chart in the so-called danger zone.

This Committee has long considered the space science program to be one of the crown jewels of the civilian space program. Apparently NASA did once upon a time too.

Mr. Goldin gave me pictures of the Comet Hayutake which the Hubble Space Telescope, a part of the space science program, took just recently. As a matter of fact, just yesterday. These pictures are dated March 27th, 1996.

Unfortunately, pictures like this are placed in jeopardy with the budget that the OMB and the President has sent to us.

In 1992, under the leadership of the former chairman of this Committee, Mr. Brown of California, this Committee divided NASA's program into two tiers. The first tier contained NASA's core programs.

Mr. Brown referred to the second tier as discretionary in nature.

Space science was in the first tier. Mission to Planet Earth was in the second.

In 1994, a year and a half ago, this Committee repeated its concern that although Mission to Planet Earth was introduced into NASA's budget as a special initiative, it was actually eating into other science programs.

Last year, this Committee and the House validated those judgments by protecting space science as a core program, and funding Mission to Planet Earth at slightly more than a billion dollars.

Yet if we look at OMB's red line on the chart over there, and the programs the White House would have us prioritize, I fear that the cuts will fall disproportionately upon space science, NASA's crown jewel.

Despite the criticism that we woefully underfunded Mission to Planet Earth at over a billion dollars a year in our effort to protect space science, the General Accounting Office has just informed my staff that it believes NASA carried forward $653 million from fiscal year 1995 into fiscal year 1996 in Mission to Planet Earth unobligated funds and unliquidated obligations.

Six hundred fifty three million dollars is about half of last year's budget. In plain English, we may face a $653 million slush fund in Mission to Planet Earth.

This sounds remarkably familiar with what the National Reconnaissance Office did in establishing a slush fund to build a building near Dulles Airport, and when the cover was blown on that, there were some people who were fired as a result.

While we can accept that Federal agencies will not always be able to spend all the taxpayers' money appropriated to them in a given fiscal year, carrying half of a $1.3 billion annual budget forward is unheard of. It certainly flies in the face of the faster-better-cheaper philosophy that has been imposed upon NASA.

In effect, Mission to Planet Earth has about $2 billion available to spend in 1996.

I look forward to Mr. Goldin's comments on this situation, but let me be very clear on this.

I will ask the GAO for a full and complete investigation into this information, and I expect NASA to fully cooperate with the General Accounting Office to get to the bottom of this issue, without going into a spending frenzy just to use up the remaining funds.

And I want the GAO to specifically account for all funds expended in the Mission to Planet Earth account from the time that this was discovered by them last week, until they make a final report.

I look forward to the testimony of Administrator Goldin, which I'm sure will shed light on how to reconcile NASA's budget, as well as an update on the status of Russia's participation in the space station.

Today we have a full plate before this Committee and plenty of questions to ask.

So let me turn either to the gentleman from Texas or the gentleman from California, Mr. Brown, for an opening statement.

Mr. Brown?

Mr. BROWN. Thank you very much, Mr. Chairman.

Thank you, Mr. Goldin, for being here this morning to hear us testify before you.

A preliminary review of NASA's fiscal year 1997 budget request leaves me with very mixed feelings. On the one hand, the request for FY '97 is mildly encouraging in that it keeps NASA's budget at the FY '96 appropriation conference level, the hard freeze in funding that his achievable within the President's overall balanced budget plan.

On the other hand, even that level marks a $90 million cut from the FY '97 funding target set by the Administration just a year ago.

Despite that, it is NASA's out year funding plan that I find to be most disturbing. While the Administration has indicated that it does not necessarily view NASA's five-year funding profile as being firmly fixed at those levels, I am very unhappy that the OMB should even consider that such an out-year budgetary profile could constitute responsible public policy with respect to a critical part of the nation's investment in research and development.

I believe OMB's approach to be short-sighted, and I intend to work to ensure that the proposed budgetary runout for NASA is never implemented.

Having said that, I would caution my Republican colleagues not to take any comfort from my criticism of what I believe to be a misguided budgetary gambit on the part of the Administration.

Republicans should remember that the President's budgetary proposal, while flawed, is still more reasonable for NASA than either last year's House Republican budget resolution or the Conference Agreement on the budget resolution.

If we're serious about asking NASA to reduce the size of the space program, we will at least need to provide them the necessary resources to streamline personnel levels, acquire more efficient technologies and restructure critical programs. These things do not come free and will not materialize from punitive budget cuts.

One of the consequences of this ill-considered competition to cut NASA's budget may inevitably include programmatic instability, lowered morale, and deferred or lost opportunities.

Administrator Goldin has made a valued attempt in his written testimony to accentuate the positive. And there is good news in the restructuring efforts made by the Space Agency. Yet the reality is that the current situation rewards NASA's aggressive and innovative restructuring efforts with further budget cuts instead of incentivizing NASA's hardworking employees by plowing the savings realized back into critical research and development initiatives.

Moreover, the current budgetary outlook sets up a zero sum game, in which for example the only way additional funding can be provided in FY '97 for worthy initiatives, like the reusable launch vehicle program, or low cost rocket engine technology development, is by cutting the planned funding for other worthy programs, such as those in aeronautics, in other parts of the NASA budget.

I believe, as I have for the past several years, that we must stabilize NASA's budget. We must maintained a balanced, vital civil space program, and we must renew our nation's commitment to a strong R&D enterprise.

It will not be easy, but the consequence of our failure to act would be serious and long-lasting.

And I thank the Chairman for this opportunity to make this statement which he will recognize parallels in some ways his own.

Mr. SENSENBRENNER. I thank the gentleman from California for his remarks.

[The opening statements of Mr. Weldon and Mr. Hall follow:]

OPENING STATEMENT OF CONGRESSMAN DAVE WELDON (R-FL)

HOUSE SUBCOMMITTEE ON SPACE AND AERONAUTICS

FISCAL YEAR 1997 NASA POSTURE HEARING

This is a very important hearing today. We will be looking at NASA's budget for FY 1997 and, more importantly, for the next several years. I have had an opportunity to study the budget over the last week, and I am very disturbed by what I see.

When I look at the long-term budget plan for NASA, I see a budget without details and clarity, a budget lacking any logical direction. My fear is that the White House has simply dictated NASA's outyear budget numbers in its quest to shape a phony balanced budget. The Office of Management and Budget has demonstrated that it is not capable of developing a real balanced budget for the nation, let alone a viable budget for the space program. The unfortunate result of this irresponsible rush towards an obvious reelection attempt is the emasculation of some of our nation's most important space programs and international scientific efforts.

NASA has made great strides in the past few years to streamline, reduce costs, and operate more efficiently, and I give Administrator Dan Goldin much of the credit for doing that. However, the Clinton Administration has done a great disservice to NASA by forcing it to accept these phony outyear numbers, especially given NASA's great strides to streamline. It will be very difficult for us to convince our colleagues that we should fund NASA any more than the President has.

Some critics may say that the Republican budget resolution last year called for similar funding levels, and that is true. However, we knew exactly where our spending priorities were, and we worked long and hard to develop our plan. Unfortunately, the Clinton Administration can give us neither detail nor clarity of NASA's outyear funding levels.

Given this precipitous spending plan, it is imperative that NASA have a clear set of program priorities. I was disappointed to see Mission to Planet Earth (MTPE) as the agency's top outyear spending priority and even more surprised not to see the Shuttle program listed among the top six priorities. The Space Shuttle is the core of our human space flight program, and it crucial to the success of the second priority, the International Space Station. It is imperative that NASA not allow budget pressures from programs like MTPE to eat into the core of our human space flight program. However, I fear that is exactly what will happen if we follow NASA's long-term budget plans.

I will work hard with NASA to ensure our human space flight program does not suffer as the White House continues its political gamesmanship. I hope that President Clinton recognizes the damage—perhaps irreparable—that he is doing to our nation's space program for the sake of political posturing.

OPENING STATEMENT

BY

HON. RALPH M. HALL

NASA Posture Hearing

March 28, 1996

Good afternoon. I would like to welcome Administrator Goldin and his colleagues to this hearing on NASA's Fiscal Year 1997 budget request. As was the case last year, we are facing a great deal of uncertainty about the long-term outlook for the Federal budget, and NASA cannot escape being caught up in the debate over our spending priorities.

Let me make my position clear right at the outset. I am a fiscal conservative. I believe we have to be sensible about how we spend the taxpayers' money, and we have to ensure that we get the maximum return for every tax dollar that we spend. While I have always been a strong supporter of the U.S. space program, I believe that it must measure up to that same high standard of performance.

In my opinion, NASA has met the challenge laid down by Congress and the Administration over the last several years to reduce its budget, streamline its operations, and still preserve a world-class space program. All NASA employees can take pride in their dedication and performance in the midst of a rough and unpredictable budgetary environment.

It is now time to stabilize the NASA budget. As you all know, NASA underwent a major restructuring last year in order to accommodate the $4.4 billion in cuts over five years that was mandated by the Administration in its FY 1996 request. It appears that NASA has made good progress in meeting that target, and I expect we will hear about their plans today. However, we can't keep cutting NASA and pretend that we will preserve the balanced, world-class space program that we all desire—a program that has delivered untold benefits to all of our citizens, including important biomedical research that is a personal interest of mine, and which will continue to do so in the years ahead if we are careful not to "kill the goose that lays the golden eggs" in a shortsighted effort to cut spending.

I think that we need to pause before we ask NASA to absorb any more cuts. I am pleased that the Administration's request for Fiscal Year 1997 maintains NASA's funding at essentially the conferenced appropriations level for FY 1996. I am *not* pleased that the Administration's runout plan would make additional deep cuts to NASA through FY 2000 before starting to recover in FY 2001 and 2002. I recognize the Administration's efforts to produce a balanced budget plan, but I think we send the wrong message when we continue to cut NASA after the heroic efforts it has made to absorb previous cuts. Instead, we may want to consider whether or not it is time to stop the cutting and simply freeze NASA's budget in the outyears at this year's level.

Well, I am sure that we will get into a number of these issues at today's hearing. Before I close, I would just like to recognize the exciting Shuttle mission that is underway at the Mir space station even as we speak. As someone who urged use of Mir long before we instituted the Shuttle-Mir program, I am pleased to see it happening so successfully. I do have some concerns about the current state of Russian participation on the International Space Station program. However, I believe that at the end of the day they will recognize that we and our other International Partners will build the Space Station with or without Russia, and that it is in their interest to be a contributing partner to it.

Again, welcome Mr. Goldin, and I look forward to your testimony.

Thank you.

Mr. SENSENBRENNER.Today our witness is NASA Administrator Daniel Goldin.

Welcome back to the subcommittee.

I see you have brought most of the senior administrative staff of NASA with you, so please proceed as you will.

STATEMENT OF DANIEL S. GOLDIN, ADMINISTRATOR, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Mr. GOLDIN. Thank you, Mr. Chairman.

Mr. Chairman, I'd like to submit my full testimony for the record.

Mr. SENSENBRENNER. Without objection.

Mr. GOLDIN. Let me call your attention to the compilation of NASA's reports on maintaining technical excellence. We've rendered this volume to all members of the Committee. There are a variety of sections dealing with our strategic planning through the management streamlining through some documentation of faster, better, cheaper.

And I would just like to call your attention to that. I'd like to talk briefly about the tremendous progress we've made at NASA, where we started, and where we are today.

Four years ago, the General Accounting Office survey of our major programs in 1992 identified an average cost growth of 77 percent. Four years later, we are underrunning program cost estimates from last year and from 1993.

Four years ago, the average space craft cost was $590 million. Today we're on track for $200 million. Our goal is about $100 million after the turn of the century.

Four years ago, we'd just completed a decade of doubling our budget, $7.2 billion in '84 to $14.3 billion in '93. Today, we're working with a budget plan that's been cut by 36 percent over the last few years.

Four years ago, we had 25,000 employees, today, it's 21,500 and we've done it without any agency-wide forced layoffs so far. And I might point out that the supervisory ratio went from 5.4 to one to 7.8 to one with a goal of 11 to one.

We restructured NASA, we completely changed the way we do business.

Four years ago, we started a bottoms up review of major programs and issues. We incorporated total quality management into day to day operations.

More recently, we did the zero base review which looked at everything we do. Based on the zero based review, we're eliminating duplication, we're making each NASA center a center of excellence.

We put management initiatives in place like cancellation reviews for major programs with a projected cost overrun of 15 percent.

We developed a strategic plan that lays out where we want to be in 25 years and how to get there.

NASA's new way of doing business is paying off.

Let me give you some examples.

Today, more than 80,000 pounds of international space station flight hardware have been built, and the program is capped at $2.1 billion a year.

We had problems with our Canadian partners, we overcame them. We had challenges with our European partners, we worked with them.

We caused our own partners grief when we redesigned the International Space Station in 1993 to reduce costs. They accommodated us.

We are experiencing some problems with our Russian partners and we are working on those problems at the highest levels of government.

In keeping with the fundamental management principles, we conducted an independent annual review of the station. It identified threats to the program and brought them to management's attention.

We've put in place action plans to recover potential schedule and cost problems. There are adequate unencumbered reserves in 1996 to cover problems if necessary. This will not impact the $2.1 billion annual cap.

Although the program has encountered some problems, we believe that we can recover.

We had technical problems in the past, like the welding and tooling on the node, and we resolved them.

Let me give you another example of the challenges we're making at NASA.

Here we have a picture of the X36 built in partnership between McDonnell Douglas—it's upside down——

[Laughter.]

Mr. GOLDIN. That's more maneuverable than we thought.

[Laughter.]

Mr. GOLDIN. We partnered with McDonnell Douglas on it, and it's a perfect example of how we're doing things differently. The X36 is a remotely piloted, tailless research aircraft, and it was just rolled out in St. Louis last week. The total cost for development, fabrication, and basic flight tests of two X36 aircraft is $17 million, cost shared between NASA and McDonnell Douglas.

The X36 cost one-fifth and took one-third the time of a recent concept demonstrator aircraft.

We used to attack technical challenges with huge programs of tests and simulations on the ground, then we'd get into the air and have to go back to the drawing board. Now we design a little, build a little, test it a little. This will enable us to make much faster progress towards revolutionary change.

Access to space costs about $10,000 per pound of payload. That's ten times too much. NASA and U.S. aerospace companies have embarked on a partnership to lead the world in low cost high reliability space launch. The space shuttle is a great machine, we're making it even safer. Safety is our number one priority at NASA.

We've invested over $1.1 billion over the last four years to improve safety. In 1991, an independent assessment was done of reliability of ascent. The odds of having a problem then were one part in 78; today it's one part in 248.

We've tripled reliability while reducing shuttle operating costs. We will continue to invest in making the shuttle safer.

I could give you example after example of how we're doing things differently at NASA.

One of the things that's allowed us to do all of this is stable funding in fiscal '95, fiscal '96, and hopefully fiscal '97.

Mr. Chairman, we appreciate your role and the subcommittee's role in making that happen.

I want to close, Mr. Chairman, by thanking you for your leadership. We never could have made all this progress without your insight and your support. We never could have done it without this subcommittee's commitment to a strong space and aeronautics program, but mostly for a strong America.

Thank you very much.

[The prepared statement of Mr. Goldin follows:]

Hold for Release Until
Presented by Witness

Statement of
Daniel S. Goldin
Administrator
National Aeronautics and Space Administration

before the

Subcommittee on Space and Aeronautics
Committee on Science
House of Representatives

Mr. Chairman and Members of the Subcommittee:

I am extremely pleased to be here today to present the FY 1997 President's budget request for NASA of $13,804.2 million. We asked for stable funding through FY 1997, and that's exactly what the President's budget gives us. This stability will enable us to continue to restructure NASA in an orderly, well-thought-out way, deliver a space and aeronautics program that's relevant, balanced and stable, and protect the human dignity of our employees and contractors.

I commend to you the entire NASA team for its exemplary performance in their efforts to keep NASA as a relevant, vigorous agency in spite of the severe budget challenges. As I describe our FY 1997 budget and statement on the policies we have instituted to make further improvements, I am sure you will share my pride in what the men and women of NASA have accomplished. Resistance to change is common in the workplace, and is heightened by the anxiety that naturally accompanies budget constraints, restructuring, and personnel reductions. Nevertheless, the NASA team of Government, industry, and academia has stepped up to the challenge.

Since 1993, NASA has reduced its out-year budget plan by 36 percent by rescoping programs, eliminating low-priority efforts, reducing support contracts, and conducting two employee buyouts -- saving the American taxpayer nearly $40 billion. From an historical perspective, the reduction is even more dramatic -- from 4.5 percent of the Federal budget during the Apollo years, NASA today is nine-tenths of one percent. The FY 1996 budget request represented a reduction of almost $5 billion to the FY 1995-2000 plan, including a specific challenge of $4 billion between FY 1997 and FY 2000. To meet this challenge, NASA undertook an intensive Zero Base Review, achieving the multi-year savings through sweeping management and organizational savings, while preserving our core programs.

We have not only kept our commitment to the Congress to constrain program cost growth. We can show, for program after program, that the life cycle cost estimate is actually lower. The GAO did a survey a few years ago which showed NASA programs averaging 77 percent cost growth from their initial estimates. Today, we are underrunning our program cost estimates from last year. If you knew nothing else of the turnaround at NASA, the difference between those two figures should convince you that our resolve is real.

When I testified before the Senate in my confirmation hearings four years ago, NASA's budget profile called for $153 billion in spending over the FY 1993-2000 period. We canceled $13.5 billion worth of programs contained in that profile, so we would have spent $140 billion for the remaining programs. The programs we terminated were discontinued for a variety of reasons: their cost estimates were unrealistically low; their schedules to completion were unacceptably long; and/or their objectives were no longer relevant to NASA's mission. We have not canceled any well-managed program which is contributing to NASA's core aeronautics and space goals. For the same FY 1993-2000 period, our current profile is $110 billion--$99 billion for ongoing programs and over $11 billion for new programs! If one compares the $140 billion to the $99 billion for the ongoing programs, NASA's funding profile is $41 billion lower--a productivity increase of 40 percent on our ongoing programs! How did we do this? We stopped doing business in the old ways. We challenged our program managers and our contractors to do more with less, to do business in new ways. That $11 billion was used to start a remarkable number of new space and aeronautics programs--over 30--ranging from small spacecraft developments and the Discovery and Mars programs, to large programs like the High Speed Research and Advanced Subsonics technology programs.

NASA is indebted to this Committee for its support and its key role in ensuring stable funding for NASA's aeronautics and space efforts over the past several years, and we look forward to continued support as the Congress completes work on the enactment of the FY 1996 Conference Agreement for NASA and considers the FY 1997 budget request. Rapid approval of the FY 1996 Conference Agreement and favorable Congressional action on the NASA FY 1997 budget request would provide the stable funding support that we are convinced is fundamental, not only to developing programs on schedule and within budget, but to position us to implement the sweeping institutional changes necessary over the next four years to meet the challenges of the Zero Base Review. With this Committee's help, we have been able to sustain our core activities and maintain balance among them.

NASA is continuing to make fundamental changes in the way it operates. We intend to achieve the President's multi-year budget plan for NASA through efficiencies, restructuring, privatization, commercialization, out-sourcing, and performance-based contracting identified in the Zero Base Review without eliminating any of our core programs.

One important step we took in restructuring was to establish a framework for making management decisions by refining the Agency's programs into five externally-focused Strategic Enterprises through which we implement our mission and communicate with our customers. NASA's Enterprises identify, at the most fundamental level, what we do and for whom. They focus on the ends, not the means, of our endeavors. The five Enterprises are:

- Mission to Planet Earth
- Aeronautics
- Human Exploration and Development of Space
- Space Science
- Space Technology

Each Enterprise has a unique set of strategic goals, objectives, and strategies that address the requirements of its primary external customers. The programmatic content of the Enterprises will evolve over time to respond to changing customer needs as well as domestic and international policy priorities. This is the new way in which we are approaching the management and execution of our programs. Next, I will address specific programs in each Enterprise area and describe not only status, but how each prospers under this new philosophy and within the FY 1997 budget request.

MISSION TO PLANET EARTH

Mission to Planet Earth is generating solid science results today leading to a better understanding of global climate change and producing practical benefits for farmers, foresters, and businesses among others.

The FY 1997 budget request for MTPE is $1,402.0 billion, an increase of $112.7 million over the FY 1996 level. With the launch of the EOS series, we will begin to gain a comprehensive understanding of the Earth as a system and the interaction between the air, sea, land, ice, and atmosphere. This science-driven, peer-reviewed program takes an evolving implementation approach; we have had nine external reviews and numerous internal reviews over the past 14 years. We have reduced program costs for the space and ground segments of EOS through 2000 from an estimated $17.0 billion to $6.8 billion. The program has preserved the basic core set of 24 science measurements while changing from six very large, costly spacecraft to at least 18 medium and small spacecraft. Mission to Planet Earth will incorporate advanced technology in the second and third phases. Based on investments today, our out-year program costs will decrease by 30 percent -- resulting in billions of dollars in savings, in addition to the 60 percent already removed from the program budget through 2000. MTPE program evolution will result in the average spacecraft development time decreasing by greater than a factor of 2, increasing the annual flight rate by almost a factor of 5, and decreasing the average spacecraft development cost by a factor of 3.

NASA is fundamentally changing the MTPE program MTPE is a key player in the **New Millennium Program (NMP)**, a coordinated NASA/commercial partnership incorporating next generation technologies such as lightweight, low-cost instruments which improve performance and decrease mission costs in the future. Another innovative NASA program, **Earth System Science Pathfinder (ESSP)**, will capitalize on new scientific understanding and emergent technologies in the design of a series of small, rapid-development science missions. They are limited to a life-cycle cost of $120 million or less, development times of 24-36 months and provide opportunities for new commercial partnerships. NASA has included $50 million in MTPE's budget request for FY 1997 to purchase science data from the commercial sector; a Request for Information will soon be released to determine the opportunities available to MTPE. MTPE is developing a **Commercial Strategy**, which is designed to drive down the cost of science data by exploiting cutting-edge and rapidly emerging industry technologies and capabilities to help meet important Earth science requirements and commercial needs. Before finalizing the Commercial Strategy, NASA plans to release the document for extensive consultation with the science and commercial communities. To create an environment conducive to rapid and continuous technology development and to prevent duplication of private sector activities, MTPE is instituting comprehensive implementation reviews every two years, allowing NASA to develop the best plan for working with our scientific, commercial, and international partners to meet our critical science needs with the most innovative approaches.

Like many of our programs, MTPE benefits from significant international participation Through the first phase, 19 countries have already directly invested $3.5 billion. Those nations have also invested nearly $4 billion in complementary international Earth observation missions for which the United States provides no financial support, but from which we receive data. This totals $7.5 billion of international investment -- roughly equal to the U.S. investment in Mission to Planet Earth during the first phase of the program.

AERONAUTICS

NASA's Aeronautics Program continues to lead the world in pioneering high-payoff technologies for our customers in the Department of Defense, Federal Aviation Administration, and U.S. industry. Aeronautics is critical to our national and economic security, and NASA plays a vital role in developing fundamental technologies that allow our military aircraft to be superior to any on Earth, enhance the safety and efficiency of the entire aviation system, and ensure significant economic returns to the Nation due to the success of U.S. companies in the fiercely competitive global marketplace Aerospace remains the United States' leading export sector.

The FY 1997 budget request of $857.8 million reflects our ability to deliver our programs for less money. Since FY 1994, Aeronautics has implemented $335 million of institutional budget reductions, and over the next four years will save another $365 million as we implement the recommendations of the Zero Base Review. We have closed or reduced the operations of 88 facilities and reduced our information management costs, while maintaining our major program milestones. These austere budgets make NASA's cooperation with DOD and FAA even more important, and we are working with those agencies with the goal of meeting the Nation's needs in aeronautics in the most efficient manner, eliminating duplication and relying on each other's strengths wherever possible.

High Speed Research (HSR) remains our number one aeronautics priority. There are serious technical barriers to building a High Speed Civil Transport (HSCT) aircraft that is quiet, clean, and efficient, with fares comparable to subsonic planes. In 1990, NASA began addressing the environmental issues of noise and emissions, and last year we had very promising results. In December we reached a critical milestone -- technology concept definition -- that will serve as a baseline to measure future advances. The FY 1997 budget request of $254.3 million will allow continued progress on the HSR Program that, once complete, should allow U.S. industry to decide whether to invest in the development of an HSCT. Market studies estimates indicate that the successful development of a domestic HSCT will result in $200 billion in sales, and 140,000 jobs for U.S. industry.

The Advanced Subsonic Technology (AST) program is making great progress by taking a systems approach to aviation; its 13 elements provide a technology foundation to ensure U.S. leadership in aircraft manufacture, aviation system efficiency and safety, and protection of the environment. Regardless of whether an HSCT will be flying in the first decade of the next century, the market for subsonic airplanes is estimated at over $800 billion over the next 20 years. The aircraft that will fill that market must be even quieter, cleaner, and more efficient than they are today, and NASA is paving the way for continued U.S. leadership with research in areas such as engine noise reduction, propulsion systems, strong, lightweight materials and fly-by-light, power-by-wire control systems. NASA also works closely with FAA on research vital to the future health of the air transportation system, including aging aircraft, general aviation, and civil tiltrotor. The FY 1997 budget request for the AST program is $187.2 million.

In FY 1997, High Performance Computing and Communications (HPCC), will continue important research on advanced computing tools for computational aerosciences and information infrastructure technology. NASA's HPCC program is focused on accelerating the development, application and transfer of High Performance Computing technologies to meet the engineering and science needs of the U.S. aeronautics, Earth sciences, and space science communities and to accelerate the implementation of a National Information commercial market for hardware and software vendors. NASA's HPCC effort is part of a multi-agency effort whose goal is to boost supercomputer speeds one thousand-fold to at least one trillion arithmetic operations per second -- one teraflop -- and communications capabilities one hundred-fold.

The Research and Technology Base for decades has led the world in aeronautical breakthroughs and advanced aviation concepts, and we intend to continue that tradition while becoming more efficient. For example, the X-36, a remotely piloted, tailless research aircraft, was rolled out in St. Louis last week. Its development cost 1/5 less and took 1/3 the time of recent concept demonstrator aircraft This project is part of NASA's work in High Performance Aircraft, which is focused on advanced military technologies.

HUMAN EXPLORATION AND DEVELOPMENT OF SPACE

The International Space Station (ISS) program is proving itself to be a model of reinvention. The management approach has been restructured, processes have been streamlined, employees have been empowered and unprecedented decision making authority has been given to the contractor team. We have gained an unparalleled level of experience, and learned much in working with other nations toward a common purpose in Space. The first phase of the ISS program has proven itself to be sound and extremely fruitful, providing technology demonstrations, risk mitigation, operational experience and early science opportunities. The next phases of the ISS are rapidly becoming a reality. The program has evolved and is dealing with a myriad of details: qualification and development testing on a major scale, completion of flight components, baselining of software releases and the reality of bringing all this activity together to ensure the timely delivery of components and modules. First Element Launch remains scheduled for November 1997 and the first crew will arrive on the Station in May 1998. The total funding for the program in FY 1997 is $2,149.0 million. This includes funding for the development and operation of the International Space Station, the science payload facilities programs and the Mir flight program.

We will continue to achieve significant U.S./Russian cooperative milestones in FY 1997 with the fifth, sixth, and seventh joint Shuttle-Mir flights. The primary objectives for these flights are to rendezvous and dock with the Mir, perform on-orbit logistics, conduct science and technology research, and provide crew exchange. Dr. Shannon Lucid has now joined the Mir crew after the successful docking of STS-76. With her, we begin a two-year period of continuous U.S. presence on Mir.

The Shuttle/Mir portion of the International Space Station program has already provided significant data on the effect of long-term space travel. The human body's reaction to microgravity compares in many ways with the effect of aging. The continued research that we are now able to perform on orbit will be applicable to understanding conditions affecting the elderly and bedridden here on Earth.

The International Space Station is intended to advance the ability of humans to safely and effectively live and work in space, with ever-increasing levels of productivity. The International Space Station will be an orbiting center of excellence where scientific research, technology development, and commercial applications come together for the benefit of humankind The scientific research performed on-board will be cross-cutting in its scope, involving the life, microgravity, Earth, and space sciences. Advanced technology will be developed in the diverse areas of communications, instrument systems, spacecraft systems, and robotics and teleoperations. The result of these efforts will affect the lives of everyone on Earth through the production, in space and on Earth, of new products and services.

The International Space Station will provide unique, long-term access to microgravity and ultrahigh vacuum environments, which cannot be duplicated on Earth. Its design will allow for major increases in energy, crewtime, and volume, compared to earlier designs, which will enable the broad base of research that is planned to be performed. The unique environment allows research to be integrated across a spectrum of disciplines in the life sciences, to include studies of cells, plants, aquatic life, and the human body. Furthermore, its architecture is reconfigurable so that technology development is not constrained. This flexibility allows researchers to conduct "breadboard"-level experiments in an environment that simulates conditions on the ground. This well thought-out, flexible design and capability will allow the International Space Station to serve as a testbed for new technologies, in order to increase productivity in space.

The FY 1997 funding request for the U.S./Russian cooperative program is $138.2 million. As the Committee is aware, NASA recently committed to assist the Russian Space Agency (RSA) in achieving its objective to extend the Mir program during the assembly phase of ISS, to the extent feasible. This requires that we take into consideration the joint interest in the Shuttle-Mir program, enhanced cooperation, and the U.S. objective of minimizing changes to the ISS. Over the last several months NASA has worked with our Russian colleagues to identify ways to reduce Russian ISS construction and operation costs so that Russia can continue to operate its Mir space station beyond the year 1997. NASA and RSA technical teams have developed a plan that is mutually beneficial, recognizing that there are still details to be worked out and that the resulting assembly sequence modifications must be reviewed and coordinated with our other international partners. Under this plan, we would add one flight to the Shuttle manifest and remanifest two additional flights, resulting in a total of nine Shuttle-Mir flights. This plan allows us to receive a larger return from our research investment in the Specktr and Priroda modules and helps the Russians overcome their logistics shortfall in 1998. We have emerged with a plan that maintains our commitments without impacting our $2.1 billion annual cap, a plan that we believe provides less risk to the ISS program.

NASA senior management was recently briefed on the findings of the Independent Annual Review (IAR) team looking at the Space Station program. As the name implies, this is a team of NASA engineering, scientific, and program control professionals independent of the Space Station program who take an annual look at the program's progress and report to NASA management. This team did exactly what it was supposed to - identify threats to the program and raise them to management attention. The good news is that hardware continues to be built at a rate exceeding our projections. The bad news is that the integration, is not keeping pace. By bringing this issue to our attention, we can now devote resources to solving it. There were no surprises in this review. The issues, both good and bad were all known at some level of the program. Action plans are already under way to recover schedule and cost. Let me stress to the Committee that no program reserves have been used and enough are available through FY 1996 to cover other problems should they arise. The International Space Station program is on budget and within the $2.1 billion annual cap.

I consider this review another example of how this program, the International Space Station and NASA have fundamentally changed A process was established to identify problems before they overtook the program and then to indicate the steps necessary to fix the problem. Will there be problems again? It is certainly possible in a program of this size, but the lesson here is that the process to identify and begin to fix these problems is working

The budget request for the Space Shuttle program supports two major components: Safety and Performance Upgrades and Space Shuttle Operations. The FY 1997 funding requests are $636 million and $2,519.9 million respectively. Safety and Performance Upgrades funding supports the modifications and improvements to the flight elements and ground facilities, including expansion of safety and operating margins, enhancement of Space Shuttle capabilities to meet customer requirements, replacement of obsolete systems, and upgrades required to meet environmental regulations. Shuttle Operations funding supports hardware production, ground processing, launch and landing, mission operations, flight crew operations, training, logistics, and sustaining engineering to maintain and operate the Shuttle fleet. In addition, this budget includes funding for facilities directly related to Space Shuttle.

The FY 1997 budget request for Payload and Utilization Operations of $271.8 million supports the operation of the Spacelab systems, payload operations for accommodating NASA payloads, Advanced Projects, and the preservation of an Engineering and Technical Base (ETB) capability at the human space flight centers.

SPACE SCIENCE

As our budgets shrink, so must our spacecraft. In the last few years NASA's Space Science Program has removed over $6 billion from its planned spending and has reengineered all aspects of the way it does business. Life cycle costs have been reduced by factors of between 5 and 10, while scientific capability has been maintained or increased. The average cost of spacecraft development from FY 1990-94 was $590 million. By 1999, it will be about $200 million and, after the turn of the century, will drop to about $100 million At the same time, NASA is decreasing development time from an average of eight years in FY 1994, to three years by the turn of the century. As spacecraft development becomes less expensive and accomplished in a shorter time, NASA will be in a position to expand the number of Space Science missions. NASA's objective is to increase the annual flight rate from an average of two in FY 1990-94, to up to 12 per year after the turn of the century, assuming some new, low-cost launch vehicles have been made available by that time. In fact, the number of Space Science spacecraft launched continues to grow, from an average of two per year in FY 1990-94, to five per year in FY 1995-99 and six per year planned for FY 2000-04.

In FY 1997, the budget request for Space Science is $1,857.3 million. The Space Science Enterprise continues a robust program of flight development activities. Space Science is now reaping a scientific bonanza as well as growing public interest from ongoing programs, such as the Hubble Space Telescope and the Galileo Mission to Jupiter. The program is looking forward to a high tempo of activities in 1997, which includes the launches of two missions to Mars and the second Hubble servicing mission.

Although the Space Science budget declines from FY 1996 to FY 1997, the level of activity does not. The decline is caused by the winding down of two major programs, AXAF and Cassini, as they approach the end of development and launch, as well as by the completion and launch of the NEAR, Mars Pathfinder and Mars Global Surveyor by the end of calendar year 1996. Funding is included to continue all of the ongoing development programs, including the Mars Surveyor program, Discovery program and Explorer program. All these programs emphasize frequent, low-cost missions on small to medium-sized spacecraft.

Funding is also included to continue the **New Millennium** program. While making spacecraft more reliable and fully autonomous, this program will also bring down the cost of development, launch, operations and data reduction. The New Millennium program is a partnership between programs for Space Science and Space Access and Technology, and consists of five Integrated Product Development Teams made up of industry and university partners. They will lead the development and delivery of advanced technologies in the areas of autonomy, communications, microelectronics and modular architectures, multifunctional systems and science instruments, and micro, electro, and mechanical systems. Some revolutionary, high-risk technologies will be tested in space through a continuing series of "demonstration" missions starting in 1998. When proven, these technologies will be incorporated into NASA spacecraft.

SPACE TECHNOLOGY

The Space Access and Technology program stimulates the development of advanced space technologies to improve the international competitiveness of U.S. aerospace and non-aerospace industries. The ability of the United States to compete in the global market mandates that it develop new and innovative technologies that will dramatically lower the cost to develop, build and launch new spacecraft. The budget request of $725.0 million in FY 1997 supports these new technologies and brings us closer to meeting the overall goal.

The Nation faces an urgent challenge to revitalize our flagging leadership in space launch capabilities. Access to space costs too much -- at roughly $10,000 per pound of payload, about ten times too much. This exorbitant expense is choking off the scientific and commercial potential of our national space program. High cost means tightly-rationed access to the unique properties of orbital space, bottlenecking the abundant promise of scientific, environmental, and commercial applications which enrich our quality of life on Earth. High cost means fewer missions of deep-space exploration that project America's pioneering spirit and expand our knowledge of the Solar System; profound questions go unanswered such as whether life of any form exists or ever existed on other celestial bodies.

The FY 1997 budget request of $324.7 million for the Advanced Space Transportation program supports NASA's leadership efforts in developing the technology for the next generation reusable space transportation system. The FY 1997 program will include concept analysis, ground-based technology development, and a series of flight demonstrators (the DC-XA, the X-34 Small Reusable Demonstrator, and the X-33 large-scale Advanced Technology Demonstrator). Each portion of this program contributes to the process of validating key component technologies, proving that the technologies can be integrated into a functional vehicle, and demonstrating the required operability to make low cost access to space a reality.

As directed by the President's National Space Policy and subject to decision criteria agreed to with OSTP and OMB, the RLV program will face two major government and industry decision points. This year's decision will be whether the underlying technologies are sufficiently advanced to proceed with building the X-33 flight demonstrator. Approval is not a foregone conclusion, although we are determined to meet this challenge. The second decision follows X-33 ground and flight tests, when government and industry will consider whether full-scale development of an operational RLV should be pursued. At that point, if the industry and the investment community are not satisfied that the development risk is low enough to proceed to full-scale development, we in NASA will press on with technology work and do what needs to be done.

Complementary to, and directly supportive of, the RLV Technology Program is the Advanced Space Transportation Program which will work to develop next-generation low-cost components maturing after the X-33 ground and flight tests. These less-mature technologies are higher risk, but offer the potential for further cost reductions beyond the RLV goals. They include propulsion components, tankage, structures, and avionics that will be applicable first to small, low-cost launchers needed to provide access to space for future small payloads.

Funding is also requested to continue ongoing efforts to provide innovative technologies to enable ambitious future space missions at a lower cost. Technologies are identified that can best meet the requirements of NASA missions across all program areas. Partnerships with industry are key to infusing new technology rapidly in science and commercial missions. The program will capitalize on advanced light-weight satellite concepts, critical subsystem and component technologies and design methodologies that have demonstrated the potential to reduce the cost of NASA and commercial spacecraft greatly. In particular, this major effort will allow both NASA and U.S. industry to exploit the next generation of miniaturization for spacecraft components, advanced instrumentation, and sensors, and to integrate them into advanced design concepts.

The Mission Support request funds the supporting activities which are critical to the success of NASA's programs. These functions cut across all of NASA's Enterprises, and include NASA's civil service workforce, space communications services, safety and quality assurance activities, and facilities construction activities to preserve NASA's core infrastructure. The FY 1997 request for these activities is $2,562.2 million. It will support 21,030 FTE, a reduction of 525 FTE from the FY 1996 budget level of 21,555 FTE. The size of the NASA workforce is heading for 17,500 by FY 2000, its lowest level since the early 1960's. NASA has been out front in meeting our budget and personnel targets. We have used buyouts and other management tools to downsize in an orderly way. We are committed to continuing along this downward slope, but we are also committed to the human dignity of our employees. We have worked hard to reach both goals.

The funding request for Space Communications continues the critical services essential to the success of every NASA flight mission, from interplanetary spacecraft to the Space Shuttle to aeronautical flight test. Funding for components of the basic NASA infrastructure and institutional facilities is included in the Construction of Facilities budget.

As part of the ongoing effort to improve planning and budgeting for the acquisition of fixed assets and similar procurements, the President's FY 1997 budget includes a separate allowance to provide full upfront funding for certain projects, which would otherwise have been funded incrementally. This allowance is included as part of the Government-wide general provisions in the Appendix of the budget. The incremental budget authority required in FY 1997 for NASA projects in this category is requested as part of NASA's FY 1997 budget request. The additional, post-FY 1997 amounts of budget authority required for full funding are requested in the separate Government-wide general provision As part of that allowance, NASA is requesting a total of $900 million in upfront funding--$342 million for the New Millennium initiative and $558 million for the Tracking and Data Relay Satellite (TDRS) replenishment. Upfront funding will enable better cost controls and savings through improved planning and greater management flexibility and accountability. The upfront funding for the New Millennium initiative is the out-year budget needed to provide the life-cycle cost, including spacecraft development, launch, mission operations and data analysis for five space missions. The upfront funding for TDRS replenishment is the out-year budget for the procurement of the three spacecraft and the associated launch services. This funding would help maintain the cost advantage of this unique fixed-price contract and could also better enable the eventual commercialization of the space network.

Mr. Chairman, it is never easy to effect significant change. But we must. The stakes are enormously high: they are no less than the future viability of the Nation's space program, enabled by a vigorous, world-class U.S. space launch capability. If this Nation is to remain a preeminent leader in exploring and utilizing the unique frontiers of space, we must face up now to the changes needed.

Mr. Chairman I hope that you and the Committee understand NASA's determination to continue to implement innovative, ultra-efficient management techniques. NASA has no monopoly on the best ideas, and we continue to seek the advice of our friends, critics, employees, contractors, and our Committees of jurisdiction. We have been criticized in the past for reluctance to cut programs; however, our recent record shows we have made hard choices by terminating the Space Exploration Initiative, National Aerospace Plane, New Launch System, Advanced Launch System, and Advanced TDRSS. We have restructured and reduced CASSINI, AXAF, and EOS--without sacrificing science content--TDRSS, the Space Station, and cut back on Space Shuttle infrastructure and flight rate. Our programs today are as trim as we know how to make them, but we are still not finished. We realize that "value for money," relevancy, and results will be the watchwords as we encounter the austere budgets of the future. As we have helped lead this Nation into the space age and into the computer age, so NASA is resolved to lead the way for efficient, effective, low-cost Government operations into the next century.

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Mr. SENSENBRENNER. Thank you very much.

Mr. Goldin, I am planning having as many rounds of questions as are necessary to solve all of the members' questions, and would also ask that members submit written questions which I would like to ask you to respond in writing, and we can have a mutually agreeable time when the hearing record will be closed, and the hearings will go to the printers.

But I will yield myself five minutes to begin with.

I would like to pursue the preliminary finding of the General Accounting Office of the $653 million slush fund in Mission to Planet Earth.

Can you tell us how this was accumulated and what plans NASA has to use with this money?

Mr. GOLDIN. Let me say this. As part of the fiscal '96 review process a month or two ago, I became aware of carry over funds in a number of the areas, not just including Mission to Planet Earth.

I was concerned, as you were, and I tasked the chief financial officer of NASA, Arnold Holz, to review the situation and to provide me some insight into it.

My initial assessment was that as a result of the restructuring and the replanning, the individual areas were not willing to commit funds until we had all the redesigns worked out. That was the initial input that I got.

But I am waiting for a report back from the chief financial officer on this issue.

Mr. SENSENBRENNER. Why can't we just use these funds to reduce the NASA budget request, or to put money into space science?

Mr. GOLDIN. I'd like to ask the NASA Comptroller to address that.

Mr. SENSENBRENNER. Mr. Peterson?

Mr. PETERSON. Sir, a large amount of the funds are in fact obligated already on contracts but have not been liquidated, paid out by the Treasury.

Mr. SENSENBRENNER. That's not what the GAO told us. They said that they were both unobligated and unliquidated.

Mr. PETERSON. Unobligated and unliquidated, the combination of the two sir is $653 million. However, the unobligated portion itself is not that large. And I have some material here, and I'll get that for you in a minute.

Mr. SENSENBRENNER. What, what is it?

Mr. PETERSON. Well, I'm sorry. I'm going to need to do some quick math here, but I'll be glad to do that, sir.

[Pause.]

Mr. SENSENBRENNER. Let's toll my time from ticking while he's looking at that.

[Laughter.]

Mr. SENSENBRENNER. Yes, Mr. Peterson?

Mr. PETERSON. At the end of fiscal '95, we had $160 million that had not been placed on purchase orders. We had an additional $50 million that was unobligated.

So for instance, in our fiscal '95 operating plan for Mission to Planet Earth of $1.3 billion, we ended the year with $1.1 billion of that committed and $1.56 billion of that actually obligated.

Now the liquidations of that, the outlays were at that time $492 million out of the total of $1.3 billion. There is the difference that you are citing, and accurately so.

Mr. SENSENBRENNER. Okay, now Mr. Peterson, can I ask you a question on how these figures compare with the unobligated and unliquidated figures in programs like the shuttle, the station and Cassini, because we're talking about almost half of the appropriation being unobligated or unliquidated, and that strikes me as being real high.

Mr. PETERSON. Yes, sir. It strikes us as being high too, and we have specifically gone after this to determine why it is that we are having delays in our liquidations.

In fact, during fiscal '95, instead of outlaying $14.2 billion as we anticipated when we testified before this Committee last year, we only outlayed $13.4 billion.

We believe a number of factors contributed to this. The redesigns certainly of major programs, the zero based review activity which caused some conservatism on the part of individuals looking at obligations and not making obligations as fast as they might otherwise have. There was actually better performance in a number of programs like Cassini, AXAF and space station.

Mr. SENSENBRENNER. Well, now that the cover has been blown on this, let me caution you, Mr. Peterson, that NASA should not go on a spending spree so that when the GAO comes back to take a look at that, these figures get down to a much more manageable level because this subcommittee is going to be looking at how the money is spent in these accounts henceforth evermore.

I guess what really disturbs me is that while we're firing NASA employees and we're going to single prime contracts and shaking up practically everything else in NASA, as a way of getting down to the budget numbers that are agreed to by Congress and the President, we have a huge amount of money that is sitting in one account.

Frankly, Mr. Peterson, that doesn't pass the smell test, and I hope that we can get some more detail so that it will pass the smell test.

Mr. PETERSON. Mr. Chairman, I'll be glad to.

I'd just like to comment further that in the discussions on the '96 appropriation with the Conference Committee on Appropriations, the reductions in Mission to Planet Earth, which amounted to $81 million, were agreed to by the agency on the basis of this unobligated carryover. We were well aware of the problem, and we were well aware that there was no defense at that time for that situation.

Mr. SENSENBRENNER. My time has expired.

The gentleman from California, Mr. Brown.

Mr. BROWN. May I ask you to continue with your comments on this situation. Frankly, I don't understand how you can do any kind of fiscal management when Congress and the Executive Office is changing your outyear figures in midstream. And I'd like to have you comment on how you feel about being able to cope with this situation.

Mr. GOLDIN. Let me start by saying this has been a very difficult process over the last four years. We haven't had outyear funding stability for the last four years. Every single year the budget has changed.

Mr. BROWN. Sometimes twice.

Mr. GOLDIN. Sometimes three times.

[Laughter.]

Mr. GOLDIN. And as a result, our people are very sensitive to not committing or expending money if there's uncertainty. It is a rolling wave. It is a terrible way to perform, it is a terrible way to operate.

So we have tried to do the best we can. And if this process continues, we're going to go back to where we were, being accountants instead of engineers and scientists. It is a very, very tough process, and I don't know that any major corporation would ever survive a quality test, being asked to do this two and three times a year.

Mr. BROWN. And despite this, you think that the treatment you're getting is absolutely outstanding and that the Congress and the Executive Office are giving you everything that you really need?

Mr. GOLDIN. Let me say this. There is a revolution going on in our country. I very carefully watch C-SPAN night after night after night. I'm a C-SPAN junkie.

Mr. ROEMER. Mr. Goldin, is that how you go to sleep at night, by watching us on C-SPAN?

Mr. GOLDIN. It's wonderful.

[Laughter.]

Mr. GOLDIN. But there is—and I listen to the citizens. People want government that costs less money. They want government that's more effective as long as it doesn't involve them. And this is a major problem.

Now I am a servant. I work for the President of the United States, and I've learned in my life to support the person who's in charge. I will carry out the directives I get from the President and the directives I get from the Congress.

But it's very important to understand, as we all talk about cutting the budget, that we can't isolate pockets and areas. And I have to admit to frustrating times in my office when being given direction that says one thing, and then having to get direction the next day to do something else, and not quite understanding it, it makes me frustrated.

I'm responsible for the employees who work for NASA, 21,500 outstanding people. If you ask me is it a pleasure to stand before them and tell them our budget's been cut again, no, it's not. The pain and suffering that they have, no, it's not.

But if the American people want the budget balanced and they want to bring it down, NASA is going to get its fair share unless someone is going to plus up the budget.

I've yet to see a budget get plussed up in the four years I've been Administrator, and I will carry out the will of the land.

Mr. BROWN. Just to encapsulate this, you're stating that the large unencumbered or unspent moneys funds that were the subject of Mr. Sensenbrenner's comments are due, at least in part, to the uncertainty that you have about your future budgets, and you need to act prudently to prepare for those uncertainties?

Mr. GOLDIN. I believe that's the case. But let me qualify that, Mr. Brown, by saying I wanted to get a thorough understanding of the basis for that. And that is why, as soon as I became aware of this issue, I had tasked the CFO of NASA to go in, to understand, and to clearly state it.

Our initial assessment was exactly what you had stated. Due to the uncertainty in the planning process, people even in the shuttle program said, when questioned why do you have this large carryover, they said the uncertainty is unbelievable and we wanted to be sure we could keep the shuttle flying in case there was a furlough, in case there were other issues that we would face up to, we felt committed to flying the shuttle.

So I think it was individual initiative on the part of people to try and find some stability in the midst of the chaos of the instructions they have. That's what I heard. However, I'd like to get Mr. Holz to address that issue for me.

Mr. BROWN. All right. We hope you'll be able to do that. But you would not see what you're doing as being comparable to what the NRO did in accumulating a couple of billion dollars to build a new office building?

Mr. GOLDIN. Absolutely positively not. We may be accused of ignorance, but I don't think you could accuse NASA of malice.

Ms. HARMAN. Mr. Brown, would you just yield for one question there?

Mr. BROWN. Certainly.

Ms. HARMAN. Just to follow up——

Mr. SENSENBRENNER. The gentleman's time has expired.

Mr. Goldin, you watch C-SPAN to help you get to sleep at night. I've found watching NASA Select does the same thing for me.

[Laughter.]

Mr. SENSENBRENNER. The gentleman from Pennsylvania, the Chairman of the Full Committee, Mr. Walker.

Mr. WALKER. Thank you, Mr. Chairman.

And I'm delighted to have you here, Mr. Administrator at our oversight hearing.

I was reading through the NASA strategic plan the other evening and I found it a somewhat interesting document. And what struck me was that Mission to Planet Earth had all of a sudden become the number one priority at NASA in that strategic plan.

Now if I recall correctly, the Augustine Report, that we have been attempting to follow in terms of budget priorities, suggested that space science was to the be number one priority of the program. And now all of a sudden, I find this one advanced.

And my main question is, on what scientific advice or outside counsel has NASA moved the Mission to Planet Earth into that particular categorization?

Mr. GOLDIN. See, Mr. Chairman, I'm not aware of such a statement if it

Mr. WALKER. Well, throughout the plan it's listed number one. In virtually everything that has been done in the report indicated that this was the topmost priority, and it just kind of puzzled me because that's nothing that has been done in consultation with this Committee as far as I know, nor do I know of any outside reports that have been done that would indicate that that kind of shift of priorities is the right one.

Mr. GOLDIN. Again, Mr. Chairman, I don't know where it's stated. I could tell you I do not believe it's number one priority for NASA. It may have been at the top of a pile but we did not prioritize one enterprise versus another. It is a high priority, but——

Mr. WALKER. Well, I mean, the mission statements, the summary of your strategic plan, I mean the mission statement puts it at the very top of the list. And I'm having——

Mr. SENSENBRENNER. Mr. Chairman, I have it as page 1-3, 1-4, 1-5, Mission to Planet Earth is top number one of all of NASA's missions.

Mr. WALKER. And in the strategic framework chart that you put in, it's the number one item in the strategic framework chart, and you know, given the fact, here's my concern. Given the fact that the budget that you presented to the Congress takes NASA's spending down to $11.6 billion by the year 2,000, if this is where we are putting the priority, where do we find the money for high speed research, advanced subsonic, new millennium, a whole series of space science projects, if this is the one that gets the first draw of funding.

Mr. GOLDIN. Mr. Chairman, I would be happy to redraw these curves and put them in alphabetical order, if that would take the implication that you're referring to.

I don't believe we said it's number one. If that is the way they put the charts together, I don't believe anywhere in the report does it say that Mission to Planet Earth is the number one priority for NASA.

If you've gotten that impression from the way things are put in order, we'll put them into alphabetical order.

Mr. WALKER. I'll tell you what I'm concerned about is that this Committee has essentially felt that following the recommendations of the Augustine Report were the right set of priorities, that space science was to be assured of a 20 percent piece of the NASA budget.

We have attempted to maintain that in what we've done. The manned programs, including the technological development programs were the second-ranked priority, and so on. And it appeared to me, in reading through this, that that had been changed in what you are putting forward.

We have the budget submission, the budget in brief, which says administration funding priorities. At the top of it is Mission to Planet Earth, so I don't think that this is total paranoia here.

Mr. GOLDIN. Let me read what it says on page four of the plan. It says, although NASA's broad mission is driven by the Space Act, the specific programs that are conducted within our enterprises, and priorities placed on them are driven by the directives of the Administration and the Congress. It's the first sentence of the last paragraph of page four.

Mr. Chairman, I'm pleased to tell you that in the last few years, we've increased the science funding as a percentage of our program from 19 percent to 24 percent. We brought the budget into balance over the last four years. We have met the spirit and the law of the

Augustine recommendation. You have a summary of the strategic plan there and I have the actual strategic plan here. I apologize.

Mr. SENSENBRENNER. The gentleman's time has expired.

Mr. WALKER. I thank the gentleman.

Mr. SENSENBRENNER. The gentleman from Texas, Mr. Hall.

Mr. HALL. Thank you, Mr. Chairman.

I certainly think the entire Committee agrees that it's time to stabilize the NASA budget. I don't really see how you operate, as former Chairman Brown has said, as you're having to operate under the mandates of Congress and the different decisions of the President.

And I don't think, Mr. Goldin, you ought to call us politicians because you're about the best one I know. You were appointed by Bush and then you were appointed by Clinton. I don't know any other single person in the world that could have ridden both of those horses, but you've done it well.

And I guess if the summary isn't exactly as you wanted, you might copy Goldwater's old statement during his race against Johnson. He told the press don't print what I say, print what I think. You might practice that.

Mr. Chairman, I just have a question or so here.

And you did take the $4.4 billion in cuts, and you did restructure, and I think you're to be congratulated for that as head of NASA and as head of something that's important to all of us. It's important that you operate within the confines of the funds that we're able to allocate, and I don't how you do it with the President changing designs every 45 minutes.

At least you've done it.

I'm interested, as you know, in the biomedical thrust and I guess my question to any of you, to General Dailey or to Dr. Cordova, whoever wants to answer it, whoever handles that. Biomedical research of course is a NASA activity that gives a promise to us of a product out of space, a cure for something, and something that the American people can say, yes, we spent our money, big money and big bucks on space, and we want something out of it other than ticker tape parades and vast expenditures of money. We like those parties and like to welcome and acknowledge the heroes that go up there, and they still are just that.

But how can we be sure that significant benefits to all the citizens for biomedical thrust, and you know of my interest in that.

I think I'd like for you to briefly review the status of that activity as to what are some of the key accomplishments to date, briefly. I only have three minutes left, right, Mr. Chairman?

Mr. GOLDIN. I'd like to have Dr. Holloway, who's in charge of the Biomedical Program, to answer that question.

Harry?

Dr. HOLLOWAY. Harry Holloway, the Associate Administrator for Life and Microgravity Sciences.

It's a pleasure to address that issue.

We of course have an ongoing very intensive program that works at making sure that the benefits that are developed go in that direction.

One of the things of course that's happened is we now have a very large collaborative program with the NIH in which our contributions go directly into the National Health Program and research that goes both for in the National Cancer Institute, Institute for Heart Disease, the bone area, very intensive work, because the problems of aging are very much like the problems of astronaut and loss of bone. We do lots of work on osteoporosis and muscle.

And in this last year, an initiative started some years ago by NASA in terms of a drug initiative, phosphanates, have now come to the market to be utilized to treat osteoporosis is one of the first treatments.

Beyond that, we also have some exciting new developments in the area of drug development.

In the Mir Program, we've recently developed a technology for flying proteins in space that allow us to expand from flying on the order of a few hundred proteins at maximum to——

Mr. HALL. That's the little biomedical reactor thrust that they have at each of the stations?

Dr. HOLLOWAY. Well this is actually a crystallization apparatus and when we've shown them to you before, that's what they've been. They've been little metal containers. But we've now developed a doer which I can't bring here because it's bigger, it's a big tank, and it starts off very cold. And we can warm that up and then protein crystals form, and we can now do perhaps 10,000 to 20,000 a flight.

This within the overall range moves this into an active and a potentially commercial area of development because each of these protein crystals subjected to x-ray crystallography can be used to develop drugs that address critical medical issues. Aside from that, on the mechanical side, we have excellent progress.

Mr. HALL. We have funds in there for that?

Dr. HOLLOWAY. We do indeed.

Mr. HALL. And that will have a place in the space station?

Dr. HOLLOWAY. That will have a place in the space station because the space station is the ideal place to do this.

Mr. HALL. And you have plans for FY '97 to continue that?

Dr. HOLLOWAY. Yes, sir, we do.

Mr. HALL. And what would be your budget for that activity?

Dr. HOLLOWAY. I'd have to go back and pull out that little section and provide that to you. I'll be glad to provide that for the record.

Mr. HALL. Would you get that and send it to me?

Dr. HOLLOWAY. Yes, sir.

Mr. HALL. Thank you.

Thank you, Mr. Chairman. I yield back.

Mr. SENSENBRENNER. The gentleman's time has expired.

The gentleman from Florida, Dr. Weldon.

Dr. DAVE WELDON. Thank the Chairman.

Mr. Goldin, in reviewing the budget proposal that was put forward, I was very concerned about the outyear numbers and I believe from some of the statements you made, that you had some concerns in that yourself.

And in particular, I was very concerned in that it appeared to me, in looking at the numbers as though some of these numbers were just more or less pulled out of a hat for the purposes of having the appearance as though we are really trying to balance the budget. And in reality, a lot of the crucial issues were not really particularly well thought through.

And I am particularly concerned about the impact that some of these budget numbers are going to have on the safe operation of the space shuttle, and in particular I was concerned in the listing of the agency's priorities in the outyears. The safe operation of the space shuttle was not listed.

Specifically it was Mission to Planet Earth, Space Station, High Speed Research, and Advanced Subsonic Technology, and High Performance Computing and Communications and New Millennium.

And I'd like you to elaborate on this issue. I think it has a lot of bearing because the space shuttle is crucial for the continued ongoing operation of the station. You list the station in there as one of your highest priorities.

Mr. Goldin, could you elaborate on that, please?

Mr. GOLDIN. It would be my pleasure. And in fact, I want to come back and say safety is the number one issue. The priorities you were talking about had to do with the expenditure of dollars. Safety remains the number one priority. There is no other higher priority.

I would like to take a few minutes, if I might, and list the nine things we're doing with regard to safety.

First, we invested over a billion dollars over the last four years to upgrade the safety of the shuttle. We've been getting a lot of experience. SAIC, an independent company, did an analysis that took us from one part in 78 to one part in 248 on ascent. Safety is being designed in and not inspected in.

The original shuttle design was as reliable as the seventies technologies would allow, but today's technology represents changes for improvement.

We are eliminating critical welds, such as the main engine heat exchanger. We're eliminating uninspectable welds in the main engine and the advanced turbo pump. We build in safety margins by reducing operating environments to the large throat main combustion chamber.

We're using the global positioning system for improved navigation. Fourth, we've built in margin in case of an abort. This is exactly analogous to an airline engine certification in case of an engine wash on takeoff.

We are qualifying the engines to higher levels of thrust so we could have more safety margin in case of abort, and we're certifying to 109 percent right now, and we may certify up to 111 percent.

Fifth, because of the concern that you expressed and others expressed about the flexibility of the budget, I personally, in this budget, added $90 million into the reserve account, roughly $70 million of those reserves were put into the operations activity where people had expressed concern.

So the message was don't be driven by cost or schedule, be driven by safety. And we gave them added flexibility there.

We are going to a single prime contractor and we're adding insight, not oversight, and most importantly we'll have a clearer line of accountability and authority and responsibility by doing it exactly the way we do it in business.

We've improved communications, we have a yellow light system. Anyone in the program could stop a launch.

Another major step we took was separating out the SR & QA organization, system reliability and quality assurance so that they have complete line responsibility from the person on the floor right up to the administrator, and no center director, no one else in the agency could interfere with that process.

So I am proud of the safety record. We plan to continue to improve reliability through deliberate activities, and as we change, there will always be difficulties. But I want to assure you we will never compromise.

In meeting after meeting, I've told people, if we have to add money to provide safety, we will. And this year, I put my money where my mouth is by adding $90 million into the reserves to send a signal that we hear, because perception is reality when it comes to morale of people.

Dr. DAVE WELDON. Do you think the outyear budget numbers are going to continue to provide you with that level of flexibility that you need to continue to operate the shuttle in a safe fashion?

Mr. GOLDIN. I'd like to make a comment with regards to the outyear. Very specifically, let me point out that in 1997, the President gave us the stability we asked for. As for the outyears, let me refer you to a statement made by senior OMB official, Larry Haas. Dan Goldin's efforts to reinvent NASA are well recognized within the White House. I would not read too much into the arithmetic formula that we used in the outyears. Secondly, I'd like to read what the budget document said. The outyear numbers should not be considered final policy numbers. They're going to be refined further by the Administration as it reviews possible savings in the form of spending reductions or new fees in all the agencies.

Once identified, these savings will contribute to adjustments to the outyear numbers for NASA.

Mr. SENSENBRENNER. When will we find that out, Mr. Goldin?

Mr. GOLDIN. I will be working with the Administration.

Let me say, this has been a very unusual year. We're talking about the '97 budget when we don't even have a '96 budget. There is a tremendous amount of turmoil, and as the agreement occurs between the President and the Congress, we will do it.

But I make this commitment. We are taking no precipitous action in fiscal '96 to put us on that downslope. I announced this at the budget briefing.

We want to work with the President. I support the President. I will work with the Administration and the Congress to resolve this issue.

It is a very difficult time, but we are going to end up with the right budget and do the right things for NASA.

Mr. SENSENBRENNER. The gentleman's time has expired.

The gentleman from Indiana, Mr. Roemer.

Mr. ROEMER. Thank you, Mr. Chairman.

First of all, I want to welcome the panelists here to our Committee and I want to thank Dr. Cordova for the picture from the Hubble for my sons, Patrick and Matthew. They love these pictures.

And I think the things that NASA is doing with regard to the X36, the Hubble, Galileo, faster-cheaper-better, there are marvelous things going on in the NASA budget that we need to put more emphasis on, that we need to get out that information to the American people.

These are the programs that Americans will support with their tax dollars.

Now I want to get into something that I don't think the American people per se want to support with their tax dollars.

And Mr. Goldin, I really like you a lot personally, but I don't like your space station. And it seems to be more and more that this space station is the search for the holy grail that we cannot find and that we cannot build.

And it's one problem after another. We have had eight different designs of the space station, and it seems to me with our problems with the Russians, we're soon going to get a ninth one.

Each time we get a new one, the cost goes up, the mission science goes down, and we run into more and more problems.

I want to ask you a question about the Russian participation.

It seems like the Russians are now not the linchpin for the space station but they have pulled the pin on the grenade and they are saying, United States and Mr. Goldin, we either want more money and more technology and more help, or we're going to detonate your space station by not participating.

The easiest part of this mission was the service module, it seems, for the Russian participation. We are now six months behind, meaning that that could eventually delay the building of the space station, eat into the reserves, go above the cap of $2.1 billion.

What is going on with the Russians?

You said in testimony Tuesday that you were going to give them now four to six weeks, or we're going to see another design.

Where are we with the service module?

What implications does that mean for the cost of the space station?

And where are you going to go with a new design if you can't work this out in the next few weeks?

Mr. GOLDIN. First let me say the space science, the science money for the station remains unchanged and capped, it has not gone down. Secondly, since the redesign in 1993, the cost of the station has not gone up. Let me also say that the Canadians had problems and we were worried that they would leave us. We worked it. The Europeans had problems, we worked it. The Russians had a problem. It's being worked at the highest levels of government. We are expecting a reply back. If we don't get a reply in an adequate period of time, we will deal with this issue and we will resolve it.

Mr. ROEMER. You said in the Senate that an adequate period of time is four to six weeks. Do you still say that?

Mr. GOLDIN. I did say that.

Mr. ROEMER. And you're still sticking with that?

Mr. GOLDIN. I will stick with that.

Mr. ROEMER. And what do you do in four to six weeks if you have not resolved this?

Mr. GOLDIN. We have developed a variety of contingency plans. We'll look at alternate approaches, and at the appropriate point in time, we will execute it. I think we have an obligation to give our Russian partners an opportunity to answer questions which have been presented at the highest levels of government, and rather than sitting here rattling our sabers, we'll give them the time. We will act in an appropriate action at that point in time.

Mr. SENSENBRENNER. Will the gentleman from Indiana yield at this point?

Mr. ROEMER. I'll be happy to yield to the Chairman.

Mr. SENSENBRENNER. And I'll stop the clock.

Mr. Goldin, as you know, when Congressman Lewis and I were in Moscow in early January, First Deputy Prime Minister Oleg Saskavitz gave us a commitment that the Krunachev Engineering Works, which is building the service module, would be paid on time so Russia could complete its commitment to the United States and other international partners on the space station.

There was one payment that was made the day after we left. Since that time, to my knowledge, Krunachev has not been paid and consequently cannot pay its subcontractors.

I thought the matter was resolved with the number three person in the Russian government gave Mr. Lewis and me and our ambassador to Russia, Thomas Pickering, the commitment that Russia would fulfill its obligations. Now we're told there's a danger that they're not going to be able to fulfill their obligations. How many chances are we going to give the Russians before we say enough is enough?

Mr. GOLDIN. I believe we ought to get the response from the highest levels of the Russian government. I understand it is going to be coming forward very shortly and then at that point in time I think would be an appropriate time to take action.

Mr. SENSENBRENNER. Mr. Lewis and I thought that talking to the number three person in the Russian government, he was talking for number one and number two.

Are you telling me that that's not the case?

Mr. GOLDIN. I wasn't at the meeting. I would hope that there may have been a communication problem and it may have been some other issue. I don't know.

Mr. SENSENBRENNER. Mr. Goldin, I was at the meeting and Mr. Saskavits was very plain that Russia would fulfill its commitments as understood in the construction of the international space station. That was in January. We are now in late March and they haven't done it.

When is our patience going to run out on this?

Because we're getting to the point where there are going to be schedule slips, if we do not take the contingency plan and run with it.

Mr. GOLDIN. I said four to six weeks because if we go beyond that point, we believe it will take us to the place where we will not have any place to go on schedule. So that is where it relates to it.

I would also like to say when Prime Minister Chernomyrdin was here and met with the Vice President, he committed to go back and have an agency-wide review of the program, which we understand he has done.

And I believe an appropriate response is being drafted up right now but I would say that the four to six weeks is the point in time at which we should trigger other actions to go down alternate paths for the space station.

Mr. SENSENBRENNER. We'll see you up here in six weeks.

The gentleman from Indiana.

Mr. ROEMER. Mr. Chairman, do you need any more time?

[Laughter.]

Mr. ROEMER. I would just say, Mr. Goldin, that to compare the Russian involvement with the Europeans and the Canadians, our taxpayers you were talking about are experiencing a revolution in terms of they want efficiency out of our government.

Mr. GOLDIN. And deserve it.

Mr. ROEMER. And deserve it.

We send about $600 million U.S. tax dollars over to Russia. We have a contract with Russia and they are now saying we don't like your contract, Americans, we want a better one, and we're going to hold you hostage until we get a better one. And they're not coming through with their end of the bargain.

And now we are at a four-to-six-week time frame where you're saying—you don't want to be in this position, and I respect you for not wanting to be in this position.

As Mr. Sensenbrenner said, they said several months ago that they would pay and they haven't.

At what point do we say to the Russians, you have not been a reliable partner?

Mr. GOLDIN. Let me also say this. The Russians have delivered every piece of hardware they were supposed to deliver for the money spent. Right now as we're sitting here, we have a U.S. astronaut——

Mr. ROEMER. We paid them for that, Mr. Goldin. We paid good taxpayer money.

Mr. GOLDIN. And we are getting benefit for that activity well beyond the dollars invested.

I have answered the question. We believe four to six weeks. We remain optimistic that the right answer will come back, but I'll be prepared to deal with the issue at that point.

Mr. SENSENBRENNER. The gentleman's time has expired.

The gentleman from California, Mr. Rohrabacher.

Mr. ROHRABACHER. Thank you, Mr. Chairman.

Thank you, Mr. Roemer.

That was, I'm anxious to see what happens the next four to six weeks as well. I'd just like to say, Mr. Goldin, I think you've done a terrific job as the head of NASA. I know you have to take a lot of guff from a lot of people. And you're the one who has to take the heat, and I want to thank you for putting up with all of us.

That's not to say that I'm not going to give you some guff in a moment here.

[Laughter.]

Mr. GOLDIN. I would be surprised if you did not, sir.

Mr. ROHRABACHER. I realized it's a tough job and you're someone who's been there and you're trying to do a good job. There's a lot of different pressures on you, and I appreciate the job you're doing. I just thought I'd say that.

But with that said, I have a little axe to grind myself about Mission to Planet Earth. I used to complain, as did many of the Republicans when the Democrats were in charge of this body, that it was impossible for the Democrats, when they were in charge, to set priorities.

And one of the biggest problems with Congress and one of the reasons we have this budget deficit looming that threatens future generations is that we have been unable to set priorities and say, I'm sorry, this is a lower priority. Thus, we're just going to cut it out and not do it.

It seems to me that we've got Mission to Planet Earth, space station shuttle, reusable launch vehicle development, which is of course something I'm very interested in, and space sciences and aeronautics, among other things in your budget.

But it seems to me that what we've got here is an inability just to say there's going to be more and more pressure and again more and more heat, and you're going to get more and more guff because you haven't really just decided we can't do all those things.

Do you, in you heart, think in the end that we can do all of those things, do justice to those projects without having the whole budget collapse around us?

Mr. GOLDIN. I would say yes, if we get stability in the budget. And we are allowed to do science and engineering instead of accounting.

Let me also say, we made some tough decisions and we cancelled NASP, we cancelled NLS, we cancelled Space Lifter, we cancelled TDRS II. We made a decision not to proceed with wind tunnels. We know how to make tough, hard decisions.

Let me also say, had we gone out and cancelled programs, we would have allowed existing programs to go on with inefficiencies that were unacceptable.

We were able to take close to $5 billion out of our budget without cancelling one significant program by cutting infrastructure and bureaucracy. I believe we must keep at this. Government cannot be treated different than industry.

And the old ways of cancelling programs by not dealing with some of the tough issues are gone, and this is where a lot of heat comes.

I believe Mission to Planet Earth is a very important aspect of the program. I might point out that Senator Stevens, in our hearing on Tuesday, came in and told us that the American insurance industry is very, very concerned about a variety of effects that could impact their industry, and wanted to see when EOS was going to be launched.

Mr. ROHRABACHER. Dan, you know I only have a couple of minutes here. I noticed you did give Mission to Planet Earth is up by nine percent in your budget. For example, space science projects is a minus nine percent.

You know, frankly, it's really trendy to talk about global warming, and I don't know about what these insurance people were talking about, but I do know the fact is Mission to Planet Earth seems to be based on trendy science and not real science and that these insurance people you're talking about might be really benefitted if we focused on determining what the weather's going to be like in the next year, rather than what's happening in the next 200 years.

Mr. GOLDIN. Could I answer?

Mr. ROHRABACHER. Please go right ahead.

Mr. GOLDIN. Mission to Planet Earth was reduced from $17.4 billion to $6.8 billion. I would say we've done a hell of a job.

Mr. ROHRABACHER. But there is a restructuring that we've been calling for by using microsatellites and newer technology that you've been resisting.

Mr. GOLDIN. We have not been resisting and we are working on those. In this budget, we have the New Millennium program that's going to do just that.

There's been a desire to go to commercial operations. We've put $50 million in this year to experiment with a data buy.

I also might say that space science is coming down because two of the gargantuan programs, AXAF and Cassini are coming down. Don't measure us by the dollars going in. We started nine new space science programs, the sum total of which is $600 million less than Galileo, and will return an unbelievable amount of science.

This was a place ripe for reduction, and had we cancelled another program to hold space science, I think we might have seen more Galileos and more Cassinis.

So that gets back to my argument.

Mr. SENSENBRENNER. The gentleman's time has expired.

The gentleman from Minnesota, Mr. Luther.

Mr. LUTHER. Thank you, Mr. Chairman.

Dr. Goldin, nice to see you to day.

When you appeared I think about a year ago, and you explained your current activities at the agency, I was impressed, as I indicated to you, with the approach you seemed to be taking in trying to downsize the agency, not maybe using the traditional approach would be to lay off a lot of low level employees in the agency and maybe undercut the effectiveness of a whole variety of activities.

You seemed to be talking about evaluating all the activities and making some tough decisions, tough decisions that might affect higher management levels, maybe eliminate entire activities or functions.

I'd like a little bit of an update on the progress you've made in that regard, and to the extent that you can quantify it. I know that it's difficult to quantify all of that, but I'd like to just hear from you on that same point.

Mr. GOLDIN. Yes. In fact, we've provided you a report called "Report on NASA Progress In Achieving Management and Technical Excellence."

Let me summarize from the section on the zero-based review which shows how, without cancelling a program, we were able to find efficiencies.

We've broken it into four categories:

Efficiencies, reducing overhead, consolidate work across centers - $850 million savings.

Restructuring, reduce program requirements, direct and overhead through a combination of reengineering and streamlining, savings $1.6 billion.

Moving work to the private sector—savings $1.4 billion.

Performance-based contracting—savings $100 million.

I get back to the point I was making when I spoke to Mr. Rohrabacher. When we started doing this, people said you can't do it, it's impossible. Let's go start cancelling programs.

I believe that if the Congress wants us to perform, they ought to hold us accountable, tell us what the budget ought to be, and then let us go out and do it.

But if we're going to cancel programs, these areas would have been savings that the American people never would have had.

But we've been able to provide these savings, and actually over the last three years, we've started 30 new programs. Our productivity has gone up 40 percent.

Mr. LUTHER. If I could follow up briefly, Mr. Chairman?

Mr. SENSENBRENNER. You have two minutes and 42 seconds left.

Mr. LUTHER. Thank you.

I have seen that report and I appreciate that.

Is there any information quantified that you can give us either here or later in the area of employment, management versus the lower level employees in the agency? Anything you can quantify in regard to that in terms of how you've gone about some of these reductions?

Mr. GOLDIN. Yes. We said we want to treat our employees with the dignity they've earned over the years. I'm very proud to say with all the cuts we've had to absorb, we haven't yet had to resort to an agency-wide forced layoff. We haven't had to resort to furloughs.

We believe we could make it through '96 and perhaps even '97, if we were given some stability in the program. And I have said over and over again, I will fight to the last ounce of energy I have to avoid having any forced layoffs. It is devastating to employees, and we will do everything humanly possible to prevent that.

Mr. LUTHER. So, Mr. Chairman——

Mr. GOLDIN. Our supervisory ratio on the chart we had was one in five. We are now about one in seven. We hope to get to one in eleven. So because of national performance review, we are more than doubling the number of employees per supervisor. I think that's another major metric that's important.

Mr. LUTHER. Has that, Mr. Chairman, been largely through attrition, then, that you've accomplished that?

Mr. GOLDIN. Yes, sir.

Mr. LUTHER. Thank you, Mr. Chairman.

Mr. SENSENBRENNER. The gentleman from Texas, Mr. Stockman.

Mr. STOCKMAN. Thank you.

I have to tell you, Mr. Goldin, that George Abbey is a very active and capable administrator down there. I commend you on your selection.

He has come up with some very interesting programs.

Mr. GOLDIN. Retirement plus plus.

Mr. STOCKMAN. He's working very hard at achieving those goals. I was very pleased in fact a while back that NASA acknowledged the fabulous work being done by the JSC workers there, and clearly you feel confident enough in their abilities to place the program management for both station and shuttle at JSC.

Mr. GOLDIN. Yes.

Mr. STOCKMAN. A very important responsibility and one we accept with pride.

As this transition occurs, there will undoubtedly be some adjustments and unexpected snags to overcome.

But I'm wondering if the best way to facilitate these important changes is to cut every space flight account at JSC. I've been told that such large funding decreases are expected results of work going on from design to production which seems only plausible on the surface.

But I ask you, is JSC the only one to face multiple hundreds of millions of dollars in reductions, and are you personally convinced that the FY '97 funding for JSC is adequate?

Mr. GOLDIN. It is not adequate, it is incorrect. And I would like to point out that when we made the major management change, we said we would have NASA headquarters be responsible for why we do things and what we do, and have the centers concerned with how, and we transferred the program management activity.

When I took a look at the fiscal '97 budget, I personally discovered there was a billion dollars left in headquarters. When I went to look to see——

Mr. STOCKMAN. You can hire a lot of secretaries with that, right?

Mr. GOLDIN. No. It's not the secretaries. Headquarters was still holding on to the management of programs. So in fact it's an error absolutely, positively, and we have identified about $100 million that remained at headquarters that should be transferred to NASA Johnson.

I don't think again it was done maliciously but we have just made this management change and the budget document was prepared before that was the case.

Mr. STOCKMAN. Isn't it still a $200 million decrease, so it's still $100 million decrease, is that correct or incorrect?

Mr. GOLDIN. That is correct at this point in time. I don't know what the exact number is, and these numbers will change from time to time.

The key point that I want to make to you is, there was a line item for a billion dollars for the NASA headquarters team. That number will no longer be a billion dollars when we complete the process of transferring out program authority for headquarters to the centers.

The first initial estimate said that on the order of $100 million in program authority was to be transferred to NASA Johnson.

There's another about $300- $400 million of funding for doing university grants. We have to explore what's the appropriate vehicle for transferring that activity, and then there's some hundreds of millions of dollars in other areas.

So the staff is in the process of establishing what's appropriate in the NASA headquarters funding to be transferred to the centers, and until that's complete, I can't give you an exact quantitative answer to your question.

Mr. STOCKMAN. So if we submit a question to you, we'll get an answer at some time specifically.

Let me ask you this question.

Do you see the cuts or reductions or savings or whatever terminology you want to use, do you see that as changing from what we have been proposed last year?

In other words, are you having a greater decrease than what you proposed last year, or is this something you are totally up in the air and you don't know what the numbers are?

Mr. GOLDIN. Oh, no. The actual work that's going on at NASA Johnson is very clear. Just establishing how much money—the work is getting done at NASA Johnson. It's a question of who holds the budget.

What we're trying to establish is that NASA headquarters should have zero funding for program activities, and we want to be sure its in the centers' budget. The work is going to be done by the center.

Mr. STOCKMAN. Okay, let me ask you this. This will probably be more pointed.

Is it possible that you're going to have to come back and ask George to come up with more programs in order to facilitate the savings or cuts or whatever for FY '97?

Mr. GOLDIN. Assuming the Congress approves the budget that the President submitted in fiscal '97, we have no reason to go back to any of the centers, any of the centers and change the budgets that they have.

Mr. STOCKMAN. Okay, thank you.

Mr. SENSENBRENNER. The gentleman's time has expired.

The gentlewoman from California, Ms. Harman.

Ms. HARMAN. Mr. Goldin, I figured out something harder than running NASA. It's running for reelection in California's 36th Congressional District.

Moving on to the Mission to Planet Earth program, I'd like to read you part of the testimony of Senator Pressler who chairs the Senate Committee on Commerce, Science and Transportation.

This is yesterday's subcommittee hearing.

He says, I am especially pleased to see that $1.4 billion has been requested for Mission to Planet Earth which I believe—this is Senator Pressler—to be NASA's most important and relevant program. Mission to Planet Earth will use the latest in satellite technology to help us understand and predict the global climate trends that affect our lives.

Mission to Planet Earth is one of the few NASA programs that will yield clear, direct benefits to American taxpayers rather than the speculative spinoff benefits promised by other space activities.

Secondly, let me just read the opening line from the Executive Summary of the National Research Council Study of Mission to Planet Earth that this Committee requested.

It says, quote. "Science is the fundamental basis for the U.S. Global Change Research Program [Mission to Planet Earth is part of that] and its component projects, and that fundamental basis is scientifically sound."

I put this on the record because some members of the Committee have questioned that.

I only have two questions.

First, the Chairman used the words "slush fund" before, and I would like to ask whether, in any fashion, the unallocated funds could be considered, in your judgment, any of your judgment, to be a slush fund.

And second, I want to ask you about the testimony a few weeks ago of Ed Freeman before this Committee. Ed Freeman was Chairman of this National Research Council Review that I just mentioned, who said that AM1, PM1 and the CHEM 1 missions should be implemented immediately.

He also stated that moving ahead with these missions was necessary to avoid delay and minimize costs. So I'm curious about a characterization of these unspent funds and whether in your view, Dr. Freeman was correct in saying that these Mission to Planet Earth programs needed to proceed immediately.

Mr. GOLDIN. To the best of my knowledge, I cannot imagine that we would ever, ever have a slush fund at NASA. It would be unacceptable that anyone would knowingly do that.

I come back and say, when I became aware that there were excess carryover funds, I directed this investigation by the NASA CFO well before the GAO report came out, and he's in the process of doing that.

The turmoil of the changing budgets and the conservatism on the part of the NASA employees to not commit or expend funds I believe is what drove it.

Secondly, I want to be on the record and say I support the President of the United States in his effort to better understand our environment and the naturally and human-induced effects on that environment, to better manage our resources and to have intelligent policymaking.

I believe we're approaching it properly. Saying that, I'm committed to everyone of the 24 measurements that have been called out by the Board of Sustainable Development in the scientific community. They are essential.

However, we will do whatever is necessary to make sure this program is productive and consumes the minimum quantity of taxpayer resources. We will launch AM-1 on time. We will launch PM-1 on time as soon as a seven-month protest is over. The only area where I might take deviation from Dr. Freeman is we have an ongoing study to see if we can make a significant reduction in the cost of the CHEM-1 mission without sacrificing the launch date.

If that is possible, we would do it. We will not compromise on getting the scientific data for this nation. But we will address the concerns expressed by members of both sides of this Committee, Democrats and Republicans, to be responsible to taxpayer funds.

And I might say that the people in Mission to Planet Earth are not leading the charge on faster-better-cheaper; space science is leading the charge. And they have some work to do and I will not take the stress off of them, and they can't whine and cry about stability until they convince me that they've reduced the program costs to the appropriate level.

Ms. HARMAN. I appreciate that answer and will be happy to yield to anyone on this Committee my remaining few seconds.

Mr. SENSENBRENNER. The gentlewoman from Texas, Ms. Jackson Lee.

Ms. JACKSON LEE. Mr. Chairman, I thank the gentlelady from California. She has a few seconds. I may like to take it, Mr. Chairman, if that is there.

Let me thank the Chairman for this hearing and this time that we have it. I think this is an important process.

Let me acknowledge to Administrator Goldin that I have consistently said, during the short tenure that I've had on this Committee, that I consider NASA and its technological work the creator of work for the 21st century, and I still maintain that.

We worked very hard. Even as you have noted, we don't have a budget, but I think we worked very hard, and even in a bipartisan manner to construct a five-year budget that would reflect or we thought would meet the viable needs of this agency to make it viable.

Mr. Chairman, I have an opening statement which I would ask unanimous consent to submit in the record.

Mr. SENSENBRENNER. Without objection.

[The prepared statement of Ms. Jackson Lee follows:]

STATEMENT BY CONGRESSWOMAN JACKSON LEE

NASA POSTURE HEARING

MARCH 28, 1996

Today this committee will accept testimony from Mr. Goldin regarding the FY 1997 NASA budget and the Administration's projections for the next several years. While the budget for 1997 is relatively stable, keeping funding levels at about the same level, I am greatly concerned about the four years thereafter; these are the same concerns I voiced about the Republican budget projections for NASA unveiled last year.

This country has arguably the best space and aeronautics program and establishment in the world with a great history of successes demonstrating the American spirit of triumph over adversity. This amazing enterprise we have known as NASA, has, as its fundamental elements, the men, women, and facilities that are an integral part of NASA.

I have said before, that we must not destroy these things which have taken a generation to create, for the sole purpose of blindly chasing this political trophy known as a "balanced budget." The research, technology development and exploration that is NASA's mission have contributed in innumerable ways to our economy, way of life and our leading role in the world. While this hearing will be concentrating on the NASA budget for the next fiscal year, I cannot allow these out-year projections to go unmentioned and unadmonished. I can only hope that the picture of the future the Administration has painted will only become better with age.

So that there is no mistake, I do have questions and concerns regarding some of the issues involving NASA over the next year and I am hoping that Mr. Goldin can provide answers to some of them; our Space Station partnership with Russia, the personnel reductions which continue to take place, and the safety of the Space Shuttle are a few.

It is my belief that each and every member of this committee, both Democrat and Republican, is dedicated to a strong and vital space and aeronautics program. It is our combined responsibility to shepherd the programs under our jurisdiction through the dangerous waters of political ideology and rhetoric. And it is under this belief that I call upon the Administration to work with the Congress to ensure that NASA's continued health and vitality.

Ms. JACKSON LEE. And I will briefly just note, Mr. Goldin, if I could, several questions that bear upon both my statement and my thrust.

Mr. GOLDIN. I'm sorry, I was distracted for a moment here. Someone was talking to me while you were asking the question.

Might I ask you to repeat it?

Ms. JACKSON LEE. Not at all. I haven't asked it. That's why I wanted to wait.

Mr. GOLDIN. Oh, okay. I'm sorry.

Ms. JACKSON LEE. I wanted to make sure that you had gotten whatever information you needed.

One of the things we were concerned about is certainly the stabilization of the space station and space shuttle for the outyears.

My understanding is that we have settled on about $2.1 billion of sorts. We had quarreled over or disagreed on 14. billion in FY '96 which moved to 13. something and we agreed on it.

We find now that we have the possibility of, in outyear 2,000, of $11.6 billion.

I think it would be inappropriate of me not to mention my concern of that after a long time of trying to work to bring that to a more positive ending.

And so my questions will be as follows:

One, we go back to Russia again, and I have, I'm going to give you a series of questions.

Are we going to get the money from Russia?

Are we going to have a true partnership?

It's been asked in all manner of ways, and I know that delicately you're trying to respond that some of this is in high level discussions and we don't want to offend our friends.

But I simply want to know what are your best guess?

Are we getting that money? It is disturbing and I think it is also disturbing in terms of our own planning.

What is happening with personnel reductions?

Are we to expect more in these next five years?

Or have we come to a plateau?

We're always looking for ways of being able to reduce such, but of course as we look to the centers now for more emphasis, is the Johnson Space Center going to have to face more reductions.

The question of safety, you answered or tried to answer that, and I just guess I want to get, you gave us nine points, I guess I just want to get the fact that is safety going to be a prominent and high priority, as I believe it should be.

Then I have question that relates to USA and how those negotiations are going on with rumors that one of the partners is trying to sell its aerospace business. And that is creating havoc in many of our aviation periodicals.

Let me also say that I might be the only one that will even use this terminology, and I am very concerned about outreach to minorities and women in this negotiation and where we are in that, and whether or not we're hunkering down because we think we've got some rules and regulations that will silence and eliminate the opportunities for those individuals, and likewise in employment, which I hear is quite difficult with some of these companies.

Lastly, let me say that in the Mir and the Russian negotiation and having to redo the manifesto on some of these, I've understood that some of the NASA research payload, such as the wake shield facility that was part of the University of Houston's work, had to be bumped.

And my question is when the two space shuttles are remanifested, to help our Russian partners with Mir.

My question is what provisions will be made for these payloads to either be reinstituted or how will we have some consistency when we say we're going to do something and we have this bumping?

If you would answer those questions, I'd appreciate it, and again I thank you for the longstanding work that you've had as we continue into 1997.

Mr. SENSENBRENNER. There are 36 seconds left in the gentlewoman's time.

[Laughter.]

Mr. GOLDIN. With regards to Russia, I remain cautiously optimistic but I'm prepared to recommend alternate approaches to the President is our Russian partners don't deliver.

There will not be more reductions if the budget doesn't get cut. However, if we get more efficient, there will be more reductions in a stable budget.

Safety will remain our number one concern.

I have no comment to make because I don't know whether Rockwell is going to be sold or not sold.

Outreach to minorities. We will have NASA representing the full cross section of America. We will have equal opportunity in everything we do.

The manifest will be redone time and time again as changes occur.

To the first order, we'll try and accommodate everyone but we cannot in every single case perform that task.

Mr. SENSENBRENNER. Thank you very much.

Ms. JACKSON LEE. The door is still open, I hope, on that payload issue?

Mr. GOLDIN. Yes.

Ms. JACKSON LEE. Thank you, Mr. Chairman.

Mr. SENSENBRENNER. The gentlewoman's time has expired.

We will now go to a second round of questions with the time that's remaining before we have a roll call.

And I would like to ask you, Mr. Goldin, a couple of questions relative to the space station.

But before saying so, let me state for the record that I do not believe that the Congress has been at all parsimonious in funding Mission to Planet Earth. There's been a billion dollar appropriation, in excess of a billion dollars for each of the last two years.

It's no secret that one of the disagreements between the House and the Senate in putting the budget together has been the funding for Mission to Planet Earth, and the reason I am bringing up the issue of the unobligated and unliquidated amounts of money that have been carried forth from one year to the next is to apply the same stringent fiscal requirements on Mission to Planet Earth that you and this Committee have applied on the other areas of NASA. And there is no reason why Mission to Planet Earth should be exempt.

And that's why I think that there should be an explanation as to these funds, and I'm looking forward to your providing that.

And I also think that there should be a comparison on the carry forward on this program with some of the other programs that

NASA has so that we can see if there is being different strokes for different folks. That's what oversight is all about.

But getting to the space station. The key, Mr. Goldin, to the partnership continuing is whether the Russians will be able to launch the service module on time.

When Mr. Lewis and I were in Moscow in early January, we were told by Dr. Kislov, who is the Chairman of the Krunachev Engineering Works, which is building the service module, that if he got the money promptly, he would be able to make up the six-month time delay.

In the negotiations that are going on, is there going to be a verifiable commitment that the Russians will be able to complete the service module on time?

Mr. GOLDIN. Yes. In fact, in some of the communications at the higher level, specific milestones were put into the discussions to make it very clear that we just didn't want a yes answer, but we wanted to measure at three or four spots during the program so we would never get into this situation again.

Mr. SENSENBRENNER. Now what's going to happen if they slow down during these milestones and say, well we've got to renegotiate it or you've got to send us more money, or we've got to do something in order to keep progress being made on the service module?

How do we enforce the commitment so that when the milestones take place, that is not a convenient excuse for the Russians to try to shake us down for a little bit more money or some more slack?

Mr. GOLDIN. I remained committed to a good partnership. However, we are making it very clear that there's no turning back beyond this point, and if one expects to be a partner in the free world, one has to perform and deliver, and we will be looking at some very specific consequences if there's non-performance.

Mr. SENSENBRENNER. Well, Mr. Goldin, for my part, and I was at that meeting in Moscow, I think I was misled by them. I don't think that they had any intention, beyond making that first $10 million payment to Krunachev in order to keep the service module operational, and I feel very bitter about the fact that the issue was not resolved when the first Deputy Prime Minister of the Russian Federation told us that it would be resolved.

And I really think that the Administration is going to have to be much more hard-nosed on this issue; otherwise, I think that we're going to end up facing the same problems that we're facing today and which we faced last January, every time one of these milestones takes place.

Mr. GOLDIN. I believe the Administration has been very clear in its communication of our expectations. Partnership means both sides meeting their commitments and doing what they said they would do. And we wait for the response to the Administration's request.

Mr. SENSENBRENNER. A second point on this. If the response is not satisfactory, and a decision is made by the President to implement the contingency plan, will this decision be made in consultation and with the agreement of the other international partners?

Mr. GOLDIN. Yes, sir.

Mr. SENSENBRENNER. In other words, it will not be a unilateral decision by the United States like cancelling the Freedom Program and going to the Alpha design was?

Mr. GOLDIN. We will communicate with our other partners.

Mr. SENSENBRENNER. That wasn't my question, Mr. Goldin. Is this going to be a unilateral decision or is it going to be a joint decision?

Mr. GOLDIN. I cannot speak for the President of the United States, but I could tell you what I believe will happen, and I strongly believe it will be a joint collaborative decision with our partners.

Mr. SENSENBRENNER. I would hope that it would be because I don't think we want to leave them holding the bag again.

Mr. GOLDIN. I believe the President is sensitive to this issue.

Mr. SENSENBRENNER. Okay. Well I would hope that he would be.

What would be the approximate cost to implement the contingency plan if a decision is made to do so either at the end of April or the first part of May?

Mr. GOLDIN. We don't have complete cost numbers, but let me say, if we were to exercise a contingency plan within the next four to six weeks, there are $300- to $400 million recoverable from existing contracts that we do have with Russia that will go along way towards resolving some of the cost issues.

But there are a variety of paths we could go down. And at this point in time, there's a range of numbers, and I don't feel we have enough of a focus on these numbers to talk about it yet.

Mr. SENSENBRENNER. Could it be done within the $2.1 billion cap?

Mr. GOLDIN. I believe that would be very difficult, very difficult.

Mr. SENSENBRENNER. If it can't be done, will the Administration request Congress to make a supplemental appropriation because the Russians cannot deliver on what they promised to do so in 1973—1993, excuse me?

Mr. GOLDIN. Again, I don't want to foresee the outcome and be negative about it, but should such an outcome occur, the Administrator would certainly be prepared to work with the Administration on the concern that you have expressed.

Mr. SENSENBRENNER. Well, Mr. Goldin, you're an appointee of the President of the United States, and what you say in public and to Congress is cleared by the White House through the OMB.

I think that because the decision to engage the Russians was made by the Administration, should that deal go sour, the Administration, rather than the Congress, is going to have to take the lead in recommending how we fix this problem.

Mr. GOLDIN. That is correct, but I don't want to be presumptive to speak with the President before I've talked to him about this issue.

Mr. SENSENBRENNER. Well, Mr. Goldin, I hope we won't have to have you back here in May to talk about this issue. If we do, I hope you'll talk to the President first.

Mr. GOLDIN. It will be my intent, sir.

Mr. SENSENBRENNER. Thank you very much.

The gentleman from Indiana, Mr. Roemer.

Mr. ROEMER. Thank you, Mr. Chairman.

Along the lines that you were just discussing and that line of questioning, Mr. Chairman, and your previous line of questioning, that you received a verbal commitment back in January from the Russians on this contract, that that wasn't sufficient enough, it seems like they have not come through with that.

Mr. SENSENBRENNER. If the gentleman from Indiana will yield, Mr. Saskavits said that he would send the Congress a letter committing the Russian Government to fulfilling its commitments on time and as agreed to with the other international partners on the space station.

The letter came to the Speaker and Senator Dole five weeks after Mr. Lewis and I went to Moscow, and it took a while for an unofficial translation to be furnished to the two of us.

That letter was not satisfactory in that it gave the Russians a door that is about as wide as a semitrailer truck to get out of.

Mr. Lewis and I sent a letter back to First Deputy Prime Minister Saskavits two-and-a-half weeks ago, pointing that out and saying that the letter that Mr. Gingrich and Senator Dole received was at variance with the verbal commitments that he gave us on a face to face basis, and could he kindly clarify that issue.

The clarification has not been received.

Mr. ROEMER. I thank the gentleman. I hope his explanation, which was very helpful, doesn't come out of my time.

[Laughter.]

Mr. ROEMER. But I'd like to say that because of this mishap, are we going to have something, such as a memorandum of understanding, during, after this four- to-six-week period that is so crucial with this contract with the Russians?

Are you going to get something that is in contractual terms, as a memorandum of understanding?

Mr. GOLDIN. I believe we will have an unambiguous agreement. Again, I do not want to——

Mr. ROEMER. Not like this one?

Mr. GOLDIN. We will have an unambiguous agreement.

Mr. ROEMER. And will it be a memorandum of understanding?

Mr. GOLDIN. I don't yet know the vehicle. We await the response. There has been an interagency review at the highest levels of the Russian Government, and I would like to give our partners the benefit of the doubt to answer the question.

Let me also say one thing. This is a very large project and we have to deal with it without reacting before we have a response. Let's get a response.

Mr. ROEMER. I would just say to the distinguished Administrator that we do need, I think when you've been fooled once, you know, we can say its their fault. If we're fooled twice with this thing, I think it's our fault.

And I think that you will have some very, very tough questions to answer from Congress if then another agreement falls apart.

Secondly, I'd like to ask you, in terms of the shuttle. We have, we've gone from a $4.6 billion budget to a $3.2 billion budget. We've gone from 34,000 employees to 24,000 employees. And we're starting to have some former employees of NASA speak in some very, very questioning terms about shuttle safety.

Brian O'Connor has recently said, as of March 7th, that he didn't have any problems with these cuts or going to a single prime contractor, but he has a very, very deep disagreement with you over going back to the Johnson Space Center and he thinks this compromises shuttle safety.

We have on record a letter from Jose Garcia, a NASA manager with 30 years of experience has written to the President saying he's very concerned about undermining safety.

Are these just disagreements between you and some former high level people, or are these something these budget cuts that Congress is implementing upon you are something we should worry more about?

Mr. GOLDIN. Mr. Garcia still remains to be an employee of NASA. He has not left.

Look——

Mr. ROEMER. All the more reason why this would be a concern.

Mr. GOLDIN. Well, I think it's wonderful that we air this in public and I think it's a very good process.

But let me say this. Brian is a terrific person. He was the first person I hired to NASA.

Mr. ROEMER. Great guy before our Committee to testify too.

Mr. GOLDIN. He's a good person. He came to me with a concern and I stopped the whole process because Brian raised a concern. I asked that the entire NASA team be polled. I did not do the polling myself because I did not want to force my will on others. The entire team came back and said, they want to proceed this way. It is a change. Brian was uncomfortable with the change, and as a result he felt he would leave the agency.

Let me tell you, when——

Mr. ROEMER. And he still is, though, Mr. Goldin. I mean here is March 7th, his remarks in the Los Angeles Times. He feels like he's got to get it on the record that he's very uncomfortable.

Now that's not like a NASA employee to——

Mr. GOLDIN. I think it's terrific that he felt comfortable to go public with this, but in the end, everyone is not going to be satisfied and we would take zero actions to change to something we believe will improve the safety. We believe we're doing the right thing. Everyone cannot agree.

Mr. SENSENBRENNER. The gentleman's time has expired.

The subcommittee will be in recess in order for us to vote.

Dr. Weldon is already over on the floor.

Mr. Goldin, in order to save time, when he comes back, he will reconvene the hearing, and he has a second round of questions for you. And the rest of us will be back once we've cast our votes.

[Recess.]

Dr. WELDON: [Presiding]. The Chairman of the Committee, Mr. Sensenbrenner, asked that I resume the questioning. I assume he'll be coming back over here shortly.

But this may get broken up some more because we have more votes coming up on the floor.

Mr. Goldin, you or your staff responded to a series of written questions that the Committee had sent to your office asking for additional detailed information, and one of them was question number five. Please list all programs funded in fiscal year '95 or/or '96 that are proposed for termination in fiscal year '97.

And you listed a number of space access and technology items in your response to include commercial space sport activities.

And I'd like you to elaborate a little bit on your rationale for that.

My own personal feeling on this issue is that this is an area where small investments made by the Administration in commercial space development could yield tremendous benefits, both in the area of science and technology advancement, as well in advancements in our further understanding of space.

So if you could elaborate on that for me, I would appreciate it.

Mr. GOLDIN. Yes, sir.

We do have $3 million in fiscal '96 which remains committed to this activity. We are in the process right now of establishing how to commit these funds. So that statement in no way will impact the $3 million that the Congress has appropriated and we have committed to work with the commercial space ports on.

Dr. WELDON. If I may, I have another question for you, and I do have a few minutes remaining here.

You and I have talked on previous occasions about the outyear numbers and particularly the impact that that is going to be having on employment.

And you have stated to me that you don't view NASA as a jobs program, and I very much respect that. I do believe that the overall vision and goal of our space program is something that certainly transcends just creating jobs in districts.

Nonetheless, as the Congressman from the 15th Congressional District, I do take a pretty close look at the issue of downsizing and how that's going to impact the various centers.

And in question number—those same written questions that were submitted to you—I think it was number three. Please provide detailed runout of full time employee in the future through the year 2002.

And as I understand it, these are not solid, hard, fast numbers and I was particularly concerned, and I'd like your elaboration on it.

In the space shuttle account, I know we're going to a single prime contractor and the plan is to downsize the number of NASA civil servants working on it.

And it seemed like a disproportionately large number of the reductions would be coming out of Kennedy Space Center, and I'd like you to elaborate on how that squares with maintaining safety in particular, being that all the hardware is assembled at Kennedy Space Center, and that's actually the most, launching is the most dangerous part of the whole operation.

Mr. GOLDIN. Let me say, first, we just launched the NEAR spacecraft. It was built by Johns Hopkins Applied Physics Lab. There was one NASA person overseeing that program.

It took 26 months from the start of the program to launch and when we set this up, we wanted to set up a program to see if it's capable of having outside entities manage things without NASA overseeing it by having the right processes and plans and procedures in place.

That proved the point to us.

Now I'm not saying we should go to one person at NASA/Kennedy, but what I am saying is we're trying to open up the space frontier, and just because we have government employees doesn't make this program safe. We would like to be able to start a commercial industry.

It is our intent to transition to the industry as fast as they are capable of accepting responsibility and in fact, we're going to hold the team on in place. If we feel during the transition we need more people, J. Honeycutt down at NASA Kennedy is instructed to go put more people on.

We're going to have a deliberate de-staffing as we go along, and if it's inappropriate, we won't do it.

But we want to have insight and no longer oversight. It is crucial that we go do this and we want to be sure that the contractor takes full accountability and responsibility.

This is the direction we're going in and this is the approach we hope to undertake, and it's not a question of balancing things out between centers.

And this is the approach.

Mr. SENSENBRENNER. [Presiding]. The gentleman's time has expired.

The gentleman from Alabama, Mr. Cramer.

Mr. CRAMER. Thank you, Mr. Chairman.

And obviously I'm at a disadvantage here in that I'm coming into this hearing that I much looked forward to a little late.

Dan, I know you've probably been asked this question before, but I'm kind of interested in the issue of the way you're managing out programs from headquarters here and picking centers of excellence at the different space centers.

Could you tell me what progress you've made in transitioning the remaining program management functions and address whether there'll be a consistent policy across all programs and field centers, because I know you're just getting into this.

Mr. GOLDIN. Yes, sir.

I put out the Administrator's guidance about two months ago that gave people a general, broad basis upon which to take actions. Each of the associate administrators is in the process right now of writing letters of delegation to the different field centers to be lead centers.

I anticipate this process will take a number of months to conclude. However, I have given very clear direction that as we change processes and procedures, a new procedure is not to be put in place until it is thoroughly vetted, put in writing, and then we operate to a new procedure so we could provide continuity and we can provide safety.

And that is the approach.

Mr. CRAMER. Once you move on with this management issue, how will decisions be made by headquarters?

How will you determine between headquarters and the field centers how decisions will be made?

Particularly, as you know in my case, at the Marshall Space Flight Center, decisions that might affect consolidation of work that was done at other centers under the umbrella of one of the field centers.

How will you as the Administrator work with the field centers on that?

Mr. GOLDIN. I am going to ask the associate administrators to specify the requirements and to be the internal customer. But they are not to get into how the job gets done. Unless they believe there's a safety issue, a legal issue, or an ethical issue, or a financial issue, the centers will have full responsibility.

For example, in the case of NASA Marshall, Dr. Wayne Littles, who is the Center Director, is going to be responsible for coordinating the agency-wide activity in access to space.

So right now he is working with the center directors across the agency to pull together an integrated program to carry out the mandates to develop the most advanced launch vehicles in the world by this nation. But he has a statement of work, and he will carry it out.

Mr. CRAMER. And you plan to have a center of excellence for space transportation, I understand?

Mr. GOLDIN. At NASA Marshall.

Mr. CRAMER. Right.

Mr. Chairman, thank you, I think that covers the main points that I wanted to.

Mr. SENSENBRENNER. Well, that concludes the number of questions we have for you, Mr. Goldin.

Thank you for coming up here.

I know that you were on the hot seat, and you've always risen to the occasion.

We hope not to see you back in May to talk about the space station.

And with that happy note, this hearing is adjourned.

[Whereupon, at 3:00 p.m., Thursday, March 28, 1996, the Committee was adjourned, subject to call of the Chair.]

[The following material was received for the record:]

Responses to written questions submitted by Chrm. Sensenbrenner resulting from the March 28, 1996, hearing.

SPACE SHUTTLE

QUESTION 1:

Currently, two contracts held by Lockheed/Martin and Rockwell, the Shuttle Operations Contract (SOC) and the Shuttle processing Contract (SPC) are in the process of being novated to the United Space Alliance (USA) under an initiative called "Early Start." The single prime contract (SFOC) is still under negotiation and will not be awarded until this coming October.

a: Can you please explain to the Subcommittee the purpose of the Early Start?"

ANSWER 1a:

"Early Start" entails the novation of the two existing contracts which USA currently plans to convert to core USA business (i.e., not to manage as subcontracts). These contracts are the Shuttle Operations Contract (SOC) and the Shuttle Processing Contract (SPC) which are currently being performed by Rockwell and Lockheed Martin. The remaining 10 contracts planned for inclusion in Phase 1 of SFOC are not planned for novation at this time. While the planned novation offers the advantages to both NASA and United Space Alliance (USA), it does not create a commitment to award of the SFOC contract.

Several advantages accrue to NASA and USA. The action demonstrates to a concerned workforce that actions are being taken to move toward a single prime contractor while doing so in a safe and carefully managed fashion. Immediately upon novation, USA will initially subcontract the entire effort back to the current SOC and SPC contractors and will begin gradually transitioning the work into USA about June 1, 1996. USA will thus be able to demonstrate company viability while continuing performance utilizing the same personnel with the same systems and management structure currently in place. USA has agreed to grant NASA unilateral right to reverse the novation. Given the fact that the corporate entities currently performing the SOC and SPC contracts will not be dissolved during the novation period, and given the commitment and requirement for the work processes to be continuously executed throughout the novation and transition to the SFOC process, NASA does not anticipate a need for novation reversal, but would have a straight forward administrative mechanism available should it choose to do so. Further, USA will provide, upon novation, guarantees of their performance during the novation time frame backed by Lockheed Martin and Rockwell.

QUESTION 1b:

Will USA receive any fees from these contracts prior to the single prime contract award?

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QUESTION 1b:

Will USA receive any fees from these contracts prior to the single prime contract award?

ANSWER 1b:

USA will not receive any fees prior to award of the single prime contract. Fees which are paid on the novated contracts will pass through USA to Rockwell and Lockheed Martin.

QUESTION 1c:

What happens to these novated contracts if the single prime contract negotiations fail?

ANSWER 1c:

In the event the novation is reversed, the contracts will revert to Rockwell and Lockheed Martin. The SOC contract would then continue under its current requirements, terms and conditions. The SPC contract would proceed through execution by NASA of the first of two priced one year option periods while NASA defined the new follow-on plan.

QUESTION 1d:

What are the near-term effects this initiative will have on civil service or contractor Full Time Equivalents?

ANSWER 1d:

At this time, we expect little or no impact on civil servants or contractor full time equivalents during the period of the novation.

QUESTION 2:

Recently, NASA announced that the Office of Human Space Flight (Code M) was to move to Johnson Space Center (JSC) as part of the "lead center" initiative. This move precipitated the resignation of a senior program manager, the third in as many years.

a: Isn't there a need for the AA for Human Space Flight to be seen as a neutral arbiter in disputes between the individual centers involved and therefore require that he remain at NASA Headquarters?

ANSWER 2a:

The Associate Administrator (AA) for Human Space Flight and the associated organization will remain at NASA Headquarters. The AA will allocate resources and assess program performance and will indeed be the neutral arbiter in disputes between centers, should they arise. Human Space Flight at Headquarters will be responsible for policy, strategic planning, external liaison, outreach or the "What and Why" for its programs. The centers have been delegated the responsibility for doing the "How." The Johnson Space Center Director has been delegated authority for Space Station and Space Shuttle program implementation as the "Lead" for these programs. The program managers will report to their Center

Director instead of a Program Director at Headquarters and the Center Director will report to the Associate Administrator for Space Flight.

QUESTION 2b:

Is this reorganization a return to the management structure in place at the time of the Challenger accident? The management organization was cited as a causal factor by the Rogers Commission?

ANSWER 2b:

The management structure in place at the time of the Challenger accident consisted of very strong Center leadership and overlapping Center functions with little emphasis on the program management. The "lead center" management structure is designed to emphasize each Center's technical areas of excellence; reduce redundant functions; and strengthen program management. Although a Center is designated as a "Lead" for a particular program, that Center will not perform all work associated with the program. The Lead Center will "buy" expertise from other Centers in support of their program. For example, the Johnson Space Center is the Lead Center for the Space Shuttle but they do not maintain the expertise or facilities to perform propulsion testing. The Center Director will "buy" propulsion testing from the Stennis Space Center in Mississippi. Stennis has been designated as NASA's Center of Excellence for the testing of space propulsion systems. This new management structure will better define Headquarters and each Center's mission as the Agency moves to a "corporate" way of doing business.

QUESTION 3:

A June 1995 GAO report recommended that the NASA Administrator identify any unresolved cost reductions within the shuttle program and further, to seek an independent organization to assess the safety implications of any future cost reductions.

a: Are there currently any unresolved cost reductions in the program?

ANSWER 3a:

The Space Shuttle program has met the challenge of the previously unresolved reductions. Attachment #1 is a trace which shows the changes initiated by the program to the budget challenge through FY 1996-2000.

QUESTION 3b:

Do you concur with the recommendation to seek an outside organization to assess future cost reduction implications for program safety? What organization do you intend to task with this critical role?

ANSWER 3b:

Yes, we do concur and the Administrator has asked the Aerospace Safety Advisory Panel (ASAP) to provide independent assessment of any impact that the Shuttle

SPACE SHUTTLE PROGRAM
TRACE

	TOTAL FY96 - 00
OUR REQUIREMENTS THIS TIME LAST YEAR FOR FY 1996 - FY 2000 EQUATED TO:	18,007
WE SUBMITTED A BUDGET IN JANUARY OF OVER THE SAME TIME PERIOD OF:	16,501 (1,506)
SINCE THAT TIME, WE ACCEPTED AN ADDITIONAL BUDGET REDUCTION CHALLENGE OF:	-1,002.7
FOR A TOTAL REQUIREMENTS CHALLENGE OF:	-2,516
HOW HAVE WE MET THAT CHALLENGE? BY THE FOLLOWING CHANGES:	**TOTAL FY96-00 REDUCTIONS**
FUNCTIONAL WORKFORCE REVIEW REDUCTIONS:	-1,077
DELETE REDESIGNED SOLID ROCKET MOTOR NOZZLE PRODUCTION @ IUKA	-226
DELETE SOLID ROCKET BOOSTER & EXTERNAL TANK RECOMPETITION	-170
REDUCE RESERVE LEVELS	-118
CONDUCT ORBITER MAINTENANCE DOWN PERIOD's @ KSC < FY96	-108
RESTORED REDUCTIONS (JSC)	-75
REESTIMATE EXTERNAL TANK OPERATIONS/RATES	-70
REDUCE MISSION OPERATION DIRECTORATE/JSC FACILITY UPGRADES	-59
REBASELINE ALTERNATE TURBOPUMP DEVELOPMENT, ENGINE HARDWARE	-50
DELETE REACTION CONTROL SYSTEM DIRECT ACTING VALVE	-50
DELETE LIGHTWEIGHT BOOSTERS	-41
FACILITY CONSTRUCTION NOT REALIZED	-39
REDUCE DEFENSE CONTRACTS MANAGEMENT COMMAND SUPPORT	-37
REDUCE PROPULSION SYSTEM INTEGRATION	-37
DELETE FLIGHT SUPPORT MOTOR's	-35
DELETE ENGINE HEALTH MONITORING (EXC. THERMOCOUPLES)	-34
REDUCE EXTENDED LIFE FUEL CELLS	-8
DELETE NOZZLE EXTENSION	-4
OTHER REESTIMATES	-142
OTHER RESTRUCTURING	-359
TOTAL FWR/RESTRUCTURE CHANGES:	**-2,736**
HOWEVER, WE ALSO HAD SOME ADDITIONAL REQUIREMENTS SINCE THAT TIME SUCH AS:	
OTHER PROGRAMMATIC CHANGES:	**221**
DIRECTED CONTINGENCY PROVISION	100
EXTEND A-2 TEST STAND TESTING	5
REESTIMATE SAFER PRODUCTION	15
REESTIMATE SUPER LIGHTWEIGHT TANK	6
SRB FORWARD SKIRT REPLACEMENT	48
SPEED/FLOW PRESSURE SENSORS	21
LAUNCH & LANDING REQUIREMENTS	26

Note: The reductions for these items are current estimates and subject to change.

Attachment 1

program's cost reductions and migrating operational functions to the single prime contractor might have on safety. The ASAP has selected Admiral Robert F. Dunn to lead a special task team to monitor Shuttle safety during this period of cost reduction and transition. The task team will provide the Administrator with periodic updates in addition to their annual, formal report.

QUESTION 4:

There have been developmental problems with the alternate turbopump for the Space Shuttle Main Engine (SSME).

a: How will this effect the date that the upgraded main engines will become operational?

ANSWER 4a:

The scheduled first flight of the Block II engine has most likely slipped from September 1997 to December 1997 as a result of development problems with the alternate fuel turbopump.

QUESTION 4b:

Can you tell us the impact, if any, this will have on the schedule for Space Station assembly?

ANSWER 4b:

Any delay in the scheduled first flight of the Block II engine will have no impact on Space Station assembly. Only two Space Station missions may possibly require the Block II engine. Both of these missions are scheduled for FY 2000.

QUESTION 5:

When will NASA seek funding for Block III engine upgrades, and what is your estimate for the level of funding that this will require?

ANSWER 5:

There has been no formal planning for Block III engine upgrades. The Block II engine is designed to be operational through FY 2012. Any decisions concerning Block III development will be made in the FY 2000 time frame.

QUESTION 6:

When will the results of the investigation on the Tethered Satellite (TSS) mission be released?

ANSWER 6:

The investigation board is scheduled to complete their activities and report to Headquarters on May 13, 1996. The board's report will be released following Headquarters review.

a: This mission was a reflight of the Tethered Satellite, the first was on STS-46. The results of the investigation notwithstanding, do we need to mend fences with the Italians?

ANSWER 6a:

NASA has several cooperative activities (Cassini, Space Station logistics module, European Space Agency's {ESA} Station contribution) where Italy is making a substantial contribution. For the TSS reflight mission, the Italian Space Agency (ASI) as well as NASA has recognized that significant data were gathered which will be important to the understanding of the electrodynamic physics of the Ionosphere. NASA certainly plans to keep ASI appraised of the investigative process through board members, observers and status reports.

QUESTION 6b:

What was the basis for the decision not to attempt a retrieval of the satellite?

ANSWER 6b:

The primary reason was that the Shuttle propellant margins were insufficient to allow a retrieval plan with a reasonable chance of success. Retrieval in the configuration of the satellite and tether was not a pre-planned contingency and required detailed study to insure it could be done safely. Additionally, retrieval and/or rendezvous would have been detrimental to the other primary payload, USMP3, whose science proved to be highly successful.

QUESTION 7:

Who will decide where to perform the Orbiter Maintenance Down Period (OMDP) for Atlantis (OV-104)?

a: What will be the factors in making this determination?
b: When will this decision be reached?

ANSWER 7ab:

The Shuttle program manager will make the decision as to where Atlantis will undergo it's OMDP in the August or September timeframe. The program manager will review the magnitude of the modifications, in addition to the normal scheduled maintenance, which will be required to ready Atlantis for missions in support of the International Space Station assembly. Also, he will review processing status of the other orbiters and manifest requirements prior to making his decision.

QUESTION 8:

As NASA downsizes, particularly with respect to the Shuttle workforce, what effort is the Agency making to encourage retirement-eligible personnel to exercise that option in order to retain the junior engineers which are so critical to the program's future?

ANSWER 8:

NASA is always concerned about maintaining a well-balanced workforce. However, during the current downsizing efforts, we are now, more than ever, concerned about our ability to recruit and retain a certain level of junior engineers. To this end, over the past two years, we have taken a very proactive approach by offering to buyout employees who voluntarily separate and provide employees with numerous outplacement tools and counseling services. As a result of the buyout authority, 1,420 employees from the NASA installations supporting the Shuttle program took advantage of the buyout offers and voluntarily separated. These installations include Headquarters, Johnson Space Center, Kennedy Space Center, Marshall Space Flight Center and Stennis Space Center. In addition to offering buyouts, NASA establishing a career transition program at each field installation. Installations' programs currently provide tools which assist all employees by preparing them to take charge of their own destiny and transition to activities or employment outside the Federal sector.

Specifically, some tools provide assistance to the more experienced employees by identifying alternative opportunities where those long-term NASA career experiences are seen as welcome assets, for example teaching and lecturing in local schools in math and science departments. In addition, for those employees who have not been in the job seeking market for quite some time, we are providing them with interviewing and networking techniques. Johnson Space Center has recently taken the lead in developing a Career's Plus Program which emphasizes phased and trial retirements for those retirement eligibles.

QUESTION 9:

Safety of human and capital assets during all phases of the transition from current practice to single prime to privatization, is the primary concern of Congress.

How will safety be assured as management structures are changed and authority is transferred from the government to private companies?

ANSWER 9:

NASA will transition functions to the single prime contractor in an orderly manner. NASA's safety and mission assurance community is providing assurance expertise and a safety focus to the Space Shuttle Program in planning for the restructuring they will together ensure that responsibilities and task transition make sense and will be properly phased. NASA S&MA will support a gradual transition of Space Shuttle S&MA activities and tasks based on the maturity and stability of the associated Space Shuttle elements and processes. The most mature and least risky processes will be transitioned first. The contractor will demonstrate that they are capable and the processes are stable prior to assuming responsibility. NASA will maintain a balance of oversight and insight before, during, and after the transition to ensure that operations and risk decision processes remain stable and effective. Processes deemed unstable or not capable will be given extra attention by NASA until effective remedial/corrective actions have been implemented.

NASA's Office of Safety and Mission Assurance (Headquarters) is currently planning actions which focus on assuring the effectiveness, efficiency and suitability of safety, reliability, maintainability and quality assurance processes within the Human Exploration and Development of Space (HEDS) Enterprise. One action is for the establishment of a HEDS Assurance Board to be in place during the transition period. The other actions include: a HEDS SRM&QA Operating Plan (to formalize the provision for SRM&QA services to the HEDS programs), a risk level screening process (to identify high risk issues and raise them for upper management review), and establishing a process verification and validation program (self-assessment and in-depth Headquarters audit) for HEDS SRM&QA activities.

QUESTION 10:

NASA managers still consider portions of the program still in developmental stages, such as the solid rocket motors. As more experience is gained with this system, a decision will be made to fold it into the control of the prime contractor.

a: Who will make this decision and what will be the criteria for that decision?

ANSWER 10a:

The decision will be made by the Space Shuttle Program Manager based upon information provided by the NASA team managing the Space Flight Operations Contract and the associated development Project. The criteria and timing for the decision will be based on: a) amount of development work remaining, b) amount of changes being made that affect critical process, c) maturity and stability of the hardware, and d) SFOC readiness to assume responsibility. Further, any transition decision will be made in conjunction with the prime contractor who must be in a position to accept and execute the additional work safely and efficiently.

QUESTION 10b:

What incentives are necessary to maintain and improve safety of operating the Space Shuttle?

ANSWER 10b:

Currently, the NASA Request for Proposal (RFP) highlights safety as its number one area of concern and demonstrates this concern by establishing safety as the prime criterion under the award fee provisions of the contract. Performance under the award fee provision of the contract will continue to be a prime incentive to the Contractor. Further, the RFP establishes performance criteria ("gates") for safety, quality and mission success upon which the payment of any earned cost incentive is predicated. Finally, the RFP outlines severe penalties associated with loss or catastrophic damage to shuttle resources. The NASA negotiation team continues to develop incentives that will ensure safety as its primary concern on the contract for the 10 year performance period.

QUESTION 10c:

What additional safety concerns would arise from taking the next step, from single prime to an actual privatization?

ANSWER 10c:

At this time, issues of privatization are difficult to address since the concept of privatization and its implementation requires additional work. Significant issues and their resolutions are being addressed to assure safety considerations are balanced with reliability and efficiency while moving to a single prime contractor. Privatization concerns or tradeoffs, like those associated with issues of trading safety and margin for potential profit, will be addressed in a timely manner. However, at the present time, the NASA focus must be on understanding completely the move to a single prime contractor and in working with the prime contractor to solve immediate problems of initial start-up, contractor/ subcontractor relationships, and the movement from government oversight to government insight.

QUESTION 11:

Of secondary concern is the cost savings to be achieved by consolidation contracts. Estimates of cost savings vary widely, as some include cost savings already achieved or being achieved under the present NASA system, while others project savings that may not actually materialize.

a: Should NASA claim savings from the reduction in civil service personnel or the single prime contractor?

ANSWER 11a:

Requirements come from the Government and it is NASA that has stepped up to innovation. NASA has drafted a performance-based contract; it has agreed to move from a management concept of oversight to one of insight; and NASA is moving to a single prime contractor as its initial step in redefining the Space Shuttle Program. Therefore, NASA will claim significant savings from civil servant reductions. Most of these civil service reductions were already being implemented and will continue in parallel with SFOC implementation. In some limited and specific cases, the single prime contractor should receive some credit for civil service reductions. Note that while the contractor should receive some credit for civil servant reductions, the award fee structure of the contract does not allow for any payment of fees to the Contractor which result from reduction in the number of civil service personnel.

QUESTION 11b:

What incentives are appropriate for private firms to achieve cost reductions?

ANSWER 11b:

Incentives for "private firms" should not significantly differ in concept from those successfully used today. To be successful, any cost incentive must be possible; that is, the Contractor must be able to increase his profit through demonstrated performance. Further, successful incentives should be designed to motivate positive performance over the breadth and length of the contract. However, for an incentive to be "appropriate" it must ensure safety and schedule as well. The task of the NASA and Contractor teams working on the prime contract will be to understand how best the parties move toward the future with incentive that motivate excellent cost performance/reduction while fitting into a frame work that ensures safety and manifest.

QUESTION 11c:

Is competition important in the selection of a single prime contractor, or was the decision NASA made last November a wiser course of action?

ANSWER 11c:

As a normal course of business, competition is important to NASA. This was demonstrated by the creation of a Source Evaluation Board which was to use a competitive procurement process to move toward the creation of a single prime contractor for the Space Flight Operations Contract. However, as outlined in the Determination and Findings (D&F) signed by the Administrator and sent to Congress, events of the procurement, particularly those related to the criticality and timing of Space Station support made the competitive process unacceptable. Based upon the points made in the D&F, all of which continue to be valid, it is NASA's belief that the decision to pursue a noncompetitive procurement was the wiser choice.

QUESTION 11d:

What additional cost savings can be achieved by taking the next step, from single prime to an actual privatization?

ANSWER 11d:

The SFOC has a performance period of six years plus two 2-year options. It is not possible at this time to predict the cost savings which may occur when and if privatization becomes a reality. Eventually, the parties must understand and agree what "privatization" means to each and how it will be implemented. However, the current focus must be on accomplishing a successful move to a single prime contractor. This will require a change of philosophy for the Contractor as well as for NASA. After successfully accomplishing this task, the parties will be able to turn to the future and cooperatively establish plans and goals.

QUESTION 12:

Third, what will the effects be of the restructuring within the Office of Space Flight? Should there be a neutral arbiter at NASA Headquarters with authority over the individual centers, or have the deficiencies been remedied to the point that this level of management can be discarded by a new streamlined program structure?

a: Do you feel confident that the restructuring will at the least maintain the same level of safety that the Shuttle has experienced since return to flight?

ANSWER 12a:

The effects of Space Shuttle Program (SSP) restructuring on the Office of Space Flight (OSF) will be those resulting from removal of OSF's former role in SSP implementation. OSF still leads the Human Exploration and Development of

Space (HEDS) enterprise and, as such, provides policy, objectives, and guidance to the SSP as an integral part of HEDS. Program implementation has, however, been vested in managers closer to day-to-day Program activities resulting in streamlined and clearer lines of responsibility and accountability along with improved efficiency. This implementation responsibility is focused at JSC, as the Lead Center, where most of the Program management was already in place and had been functioning as Program integrator since the Program began. The Program integration management methodologies being used already incorporate the lessons learned from the Challenger accident and the required corrective actions have been in place since the shuttle resumed flying with STS-26 in 1988. Communication among the Program participants is excellent and there is no reason to expect any deterioration as a result of the restructure. The Program Manager at JSC conducts frequent (daily) and effective management forums in which open communications are encouraged and received. These forums will continue after restructure is in place and the Space Flight Operations Contract (SFOC) has been implemented. Additionally, program implementation will continue to be guided by a program forum comprised of the JSC, MSFC, KSC, and SSC Center Directors. OSF will also be represented in this group and will function as the "customer" of the Program. We, therefore, believe these forums provide excellent management and control of Program activities and we do not require the Headquarters program management to resolve the issues.

NASA's top priority throughout the restructuring process and implementation of the SFOC has been, and will continue to be, maintenance of safety. All Program participants, especially those in management positions, are encouraged to express any concern at any time. Safety considerations are currently embedded in the program management processes and will remain so. Additionally, independent safety assessment capability has been retained and reports directly to the Associate Administrator for Safety and Mission Assurance (S&MA) at NASA Headquarters. Also, the JSC Center Director has established the position of Associate Director (Technical) with responsibility for overseeing program safety and providing recommendations to the Center Director. (Astronaut John Young currently occupies this position.) Particular attention will be paid to safety considerations at KSC where the flight hardware will be processed by SFOC. There, NASA will be instituting an extensive audit, surveillance, and independent assessment of SFOC processing activities which are required to be compliant with existing NASA-approved processes. The Program Manager has retained the KSC management team as an integral part of the program management structure and will rely upon them for maintaining insight into launch, landing, logistics, and S&MA activities. This team will continue to play a major role in Flight Readiness Review (FRR) activities with full membership on the FRR Board, to be chaired by the Lead Center Director. Finally, we believe execution with the incumbent operations support contractors for the SFOC provides maximum assurance of continuation of safe operations.

QUESTION 13:

In its report, "Space Shuttle: Need to Sustain Launch Risk Assessment Process Improvements," GAO has made the recommendation that NASA ensures flight readiness review participants understand and agree on the minimum issues that should always be discussed at the review and the level of detail that should be provided.

a: Under the proposed restructuring, who will chair flight readiness reviews?

ANSWER 13a:

NASA will continue to chair the flight readiness reviews. The Associate Administrator for Space Flight has delegated that responsibility to the Lead Center Director for the Space Shuttle (Director, Johnson Space Center).

QUESTION 13b:

Who will represent NASA Headquarters at flight readiness reviews?

ANSWER 13b:

The Deputy Associate Administrator for Space Flight (Space Shuttle) and the Associate Administrator for Safety and Mission Assurance will represent NASA Headquarters at the flight readiness reviews.

QUESTION 14:

The decision that you made to proceed with sole source negotiation with United Space Alliance for the Shuttle Flight Operations Contract was an extremely critical decision.

a: Who recommended this course of action to you?

ANSWER 14a:

The Source Evaluation Board was asked by the NASA Administrator to evaluate the expressions of interest which had been submitted by prospective prime contractor candidates and to make a recommendation regarding whether or not to continue with the competitive procurement. After being briefed on the results of this evaluation, the Administrator determined a non-competitive award was in the Agency's best interest.

QUESTION 15:

The Aerospace Safety Advisory Panel's February 1996 Annual Report stated that "Obsolescence of Space Shuttle components is a serious operational problem with the potential to impact safety."

a: How do you propose to remediate this problem?

ANSWER 15a:

Obsolescence has and will continue to be a challenge in maintaining adequate logistics support for flight hardware. Identification of such issues, with enough time to react, is the key to remediation. Where appropriate, lifetime material buys are made. The establishment of alternate supply sources, including the NASA Shuttle Logistics Depot, provides a manufacturing source for some obsolete components and test equipment. When these solutions are not practical, materials substitution or redesign is initiated

SPACE STATION

QUESTION 16:

Can the U.S. proceed without Russia, if Russia fails to meet the schedule for the service module?

ANSWER 16:

We are prepared to build the International Space Station with, or without, Russian contribution. Contingency planning has always been an active part of ISS program activity. If the Russians, or any other partner falters, or even if an element is lost in a launch accident, the ISS has an action plan to proceed. Our contingency plans address the potential timing of such event and address all the critical functions necessary should a partner drop out of the program, With respect to Russian contributions, we have developed a strategy to provide propulsion capability and resupply, environmental control and life support, an early crew module, dry cargo resupply and a crew return vehicle. We have a design concept and development plan available to replace the FGB and SM propulsion functions. Contingency plans have been developed for each flight in the assembly sequence, both Russian and US, to identify replacement strategies for individual elements and assembly sequence options. If the situation in Russia significantly degrades in the next few months, funds can be recovered from the FGB and $400M contracts. Development of the U.S. Control Module (CM) could then be turned on.

Currently, we could contain the impact to assembly to roughly a year and one half or less and the impact to science capability to approximately one year. Although estimates have not been independently assessed, it appears as though this activity, and the necessary assembly and utilization replanning could be accomplished for less than the $2 billion previously stated as a cost savings when the Russians were brought into the ISS program. We continue to assess options that would allow us to further reduce our schedule and cost impacts.

QUESTION 17:

The Russian Space Agency says that its contractors have not received payments from the Central government that cover the cost of Russia's contributions.

How can NASA be assured of Russia's financial support for its side of the program?

Isn't that what the Gore-Chernomyrdin level talks are for? Does President Clinton need to talk to President Yeltsin?

ANSWER 17:

We have been following the situation regarding Russian payments to its contractors on the ISS program very closely. We understand that discussions are taking place within the Russian government concerning financial support for its participation in the program, and we are cautiously optimistic that these discussions will be concluded soon and will result in Russia's reaffirmation of its support.

NASA has addressed its concern regarding Russia's level of support for these critical near-term activities to the Russian Space Agency, and the Administration has relayed a similar concern to the Russian government. We understand that, on April 12, 1996, the Vice President has received a response from Russian Prime Minister Chernomyrdin regarding Russia's commitment to the International Space Station program in which the Prime Minister states that Russia will meet its commitments to the Station program and has given necessary instructions to ensure timely financing of Russian participation in the Station. Matters related to Russian participation in the International Space Station have been, and will continue to be a primary topic of the Gore-Chernomyrdin Commission on Economic and Technical Cooperation, which has proven to be a highly effective mechanism for addressing issues of this nature in our joint space activities with Russia.

QUESTION 18:

Can the Russian Contractors use conventional bank financing to keep their program solvent while the Central Government figures out whether to pay on time?

ANSWER 18:

While financial arrangements such as this may be an option for Western firms, our understanding is that they are not typically available in the case of Russian enterprises involved in work on the ISS program. However, it is our understanding that some major Russian enterprises involved in the ISS program, notably Khrunichev and RSC Energia, have supported work on the ISS program out of internal reserves in anticipation of a decision by the Russian government to provide adequate and steady funding to allow Russia to meet its commitments to the ISS program.

QUESTION 19:

Recently, NASA conducted an internal review of the Space Station's cost versus performance and found a $44 million cost "overrun."

a: How does this overrun impact the program and specifically the $2.1 billion program cap?

b: Are program reserves sufficient to recover the two week schedule slip indicated by the study?

ANSWER 19:

The Independent Annual Review (IAR) conducted by a NASA team for the International Space Station is part of a standard program control process in place at NASA. Every highly visible program which has a Congressional requirement for a Project Status Report, such as the International Space Station, is reviewed by the Program Management Council (PMC), which is led by the Deputy Administrator and is comprised of senior agency officials. Each program that the PMC reviews has a Program Commitment Agreement which outlines specific technical and schedule commitments. The PCA is signed by the Administrator and the cognizant Associate Administrator. Once a year, an independent team conducts a review of the program to measure its performance on the basis of these technical and schedule commitments. During the IAR process, issues and problems are highlighted to program management and recommendations are proposed. In addition, each program sets up a programmatic baseline. This programmatic baseline forms the basis on which each program is measured by the PMC on a quarterly basis.

The $44 million cost variance and two-week schedule variance reported during the Independent Annual Review have been well known to International Space Station program senior managers for some time. Both variances are calculated against an internal performance baseline. The cost baseline does not include the $3 billion in program reserves; the schedule baseline does not factor in schedule margins which exist for each flight.

The performance measurement system which identified the cost and schedule variances exists to highlight issues on a timely basis for senior program managers. The performance baselines and variances are reviewed by senior program managers on a monthly basis. When issues are identified, integrated product teams formulate recovery plans which are then validated and tracked by senior management. The recovery plans for all cost and schedule variances are on track, and management remains confident that most, if not all, variances will be recovered.

The International Space Station program remains committed to maintaining its $2.1 billion annual limit and $17.4 billion funding cap through completion of assembly. Finally, the ISS program remains confident that the current assembly schedule milestones will be met.

QUESTION 20:

The General Accounting Office has also examined the Space Station program and found approximately $507 million in unpriced, undefinitized changes to the Prime contract baseline.

a Are contract changes being budgeted for accurately?

b: When do these contractor cost liens get paid? When are these costs made a part of the program baseline?

ANSWER 20:

The $507 referenced in the GAO report reflected the contractor's estimate of changes over 180 days old which remained undefinitized as of January 1996 . The *total* amount of undefinitized changes at that time, according to contractor estimates, was $723 million. This figure included of $207 million for the FGB, $76 million of disputed overhead charges, and $440 million of other authorized changes.

Contract changes *are* being budgeted for accurately. The FY 1997 Budget to Congress contains $580 million for changes, consisting of $215 million for the FGB and $365 million for other authorized changes, all within the baseline budget. (The FGB number includes the $207 million for the Boeing-Khrunichev portion, plus associated FGB costs *not* within that contract modification.) NASA believes that the pre-proposal estimates received for other authorized changes are high and contain a large amount of contingency. NASA expects to negotiate lower costs for the majority of these changes, and remains confident that the amounts carried in the budget are adequate. The $76 million in disputed overhead charges is included as a threat against budgeted reserves, in the event that DCMC's decision on CAS issues does not favor NASA.

As of the end of May 1996, there are 169 undefinitized changes in the program, with a contractor estimated value of $512 million. Proposals totalling $235 million have been submitted to NASA for 74 of these changes. We expect to negotiate these by the end of June. Proposals for an additional 75 changes will be submitted to NASA by June 30, estimated by the contractor at $200 million. These should be negotiated by the end of July. The last 20 changes are estimated by the contractor at $77 million, and we expect to complete negotiations on these by late July or early August.

Contractor costs are paid according to the terms of the contract. Any changes which become part of the contract baseline are paid according to these same terms. Costs become part of the program baseline when management is confident that an accurate estimate of the cost of a particular item has been defined and when it becomes apparent that the item is required for successful completion of the program. For example, even though the FGB change remains undefinitized, it has been added to the International Space Station program baseline because it is a program requirement and management maintains high confidence in the estimate of $207 million.

SPACE SCIENCE

QUESTION 21:

Historically, NASA has relied upon expert panels convened under the auspices of the National Academy of Sciences to lay out long term goals for space science from which NASA identifies specific missions to meet those goals.

a. Given the bleak outlook for space science, how will NASA be able to step up to the plate with the Academy s goals?

ANSWER 21a:

The goals and strategies for space science developed by the National Academy of Sciences are the framework within which NASA defines programs in collaboration with the science community. In recognition of an increasingly constrained budget for space science, NASA has aggressively reengineered the way we do business to accomplish more with less. The current budget request contains sufficient funding for most of the initiatives identified in the OSS Strategic Plan published last year. We will continue to develop new technologies as best we can in order to accomplish the goals defined by the Academy within the budget approved by the

Congress and the President. Missions currently in the Space Science Strategic Plan most at risk are the Thermosphere, Ionosphere and Mesosphere Energetics and Dynamics (TIMED) and Pluto Express missions.

QUESTION 21b:

Is the Academy preparing any studies now on long term space science goals?

ANSWER 21b:

The Committee on Planetary and Lunar Exploration (COMPLEX) of the Academy's Space Studies Board (SSB) has recently published a report on the long-term strategy for planetary science entitled An Integrated Strategy for the Planetary Sciences: 1995-2010. The SSB itself has recently published a report entitled A Science Strategy for Space Physics. Finally, The SSB's Committee on Astronomy and Astrophysics is working on an updated science strategy for space astronomy and astrophysics that will include an assessment of new NASA mission concepts.

QUESTION 21c:

If so, how do the outyear budget projections factor into the Academy's recommendations?

ANSWER 21c:

NASA cannot say what use, if any, the Academy makes of outyear budget projections in formulating its reports on strategies for space science. Generally, the Academy recommendations are independent of budget, and NASA devises strategies to implement them within the budget climate.

QUESTION 22:

NASA originally started the New Millennium Program in conjunction with the space science program to develop new technologies for low-cost space science and create a virtual presence in the solar system. New Millennium has since become part of Mission to Planet Earth as well.. Please describe the New Millennium initiative and include a list of all programs that are part of this initiative.

ANSWER 22:

NASA envisions a space and Earth science program for the 21st century comprising frequent, affordable missions with highly focused objectives. Numerous microspacecraft carrying advanced miniaturized instruments will return a continuous flow of information from space to Earth. Using revolutionary new technologies and architectures that will reduce the costs and enhance the capabilities of missions, the United States will gain important data about Earth, the solar system, and the universe. Exciting new insights will engage the public interest and provide new learning opportunities for students at all levels. The wealth of new information and its widespread dissemination, combined with the rapid development, deployment, and transfer of new technology, will maintain U.S. leadership in space and Earth science and technology.

From the very beginning, the NMP encompassed support for the Mission to Planet Earth, as reflected in the NMP Plan, April 14, 1995. While the Mission to Planet Earth was supported in the original concept, the actual implementation the program was started with the Deep Space mission first and then Earth Orbiting missions. This was done to keep the program at a manageable size while formulating the initial operating concepts. In addition to the science codes, the Office of Space Access and Technology (OSAT) funds technology developments in support of the NMP for both earth and space science. OSAT also contributes directly to the earth orbiting missions in the Advanced Smallsat (SSTI) Program. In summary, the NMP is a joint Office of Space Science and Office of Mission to Planet Earth program within NASA, while also involving other non-NASA government programs.

The NMP program will launch a series of technology-rich flights, starting in 1998, to systematically flight demonstrate and validate new technologies that will have benefits and applications for NASA's programs in planetary exploration, astrophysics, space physics, and Earth sciences.

The first New Millennium technology validation effort will feature a 1998 launch of a small spacecraft destined for a flyby of an asteroid and a comet. The proposed 220-pound spacecraft will demonstrate a variety of advanced technologies that help enable many ambitious deep space and Earth-orbiting missions envisioned by NASA for flight early in the next century. In particular, the spacecraft will be the first to rely on solar electric propulsion for its main source of thrust, rather than conventional solid or liquid propellant-based systems.

Other technologies likely to be demonstrated on this first flight include a miniaturized deep space antenna and related telecommunications equipment, advanced solar arrays and lithium ion spacecraft batteries, and low-mass spacecraft structures.

The spacecraft's science instrument payload will include a miniaturized imaging spectrometer that will make chemical maps of the target asteroid and comet. New mission operations techniques will give the spacecraft independent decision-making abilities that are unprecedented for such a deep space mission. Future New Millennium missions will, likewise, develop key technologies for NASA s planned space and Earth science missions.

International Payloads

QUESTION 23:

The FY 1997 budget appears to terminate the international payloads line after FY 1997. That line item gave flexibility to take advantage of opportunities to put experiments on other countries spacecraft. How does this action correlate with the desire to make extensive use of international cooperation?

ANSWER 23:

International cooperation is a fundamental aspect of NASA s space science program, having been a part of over 70 percent of Space Science missions throughout NASA s history. NASA will continue to pursue opportunities to fly instruments on the spacecraft of other space agencies, however, we are not going to continue to fund these payloads on a level-of-effort basis. In the future, NASA will treat such opportunities as new starts which will compete with all other potential programs on scientific and technical merit. Funds will be requested for those new starts, both U.S. and international, which compete successfully for the available resources.

QUESTION 24:

Is there funding in the FY 1998 budget for Phase A of Pluto Express? Are the total life cycle costs for Pluto Express a part of the NASA runout (based on $13.168 billion in FY 2000; before OMB cuts)?

ANSWER 24:

Pluto Express life cycle costs are not included in the current NASA runout. There is minimal funding for continued planning activities for Pluto Express in FY 1998.

Mars Exploration

QUESTION 25:

Last year, NASA submitted a report to this Committee as required by House Report 106-654 (H.R. 4489, the 1995 NASA Multi-year House Authorization) to provide a plan for enhancing cooperation between the United States and Russia on Mars Exploration. What is the status of this joint cooperation? With the decrease in the NASA space science budget do you see the Mars Together mission slipping? If not, will the space science budget ramp back up to accommodate this joint mission or will funds be taken from other science missions?

ANSWER 25:

The hardware phase of Mars Together started in July 1995 with an agreement to include Russian science participation in the 1998 U.S. Mars Surveyor missions. The Russian Institute for Space Research (IKI) will provide the optical bench for the principal instrument on the 1998 Mars Surveyor orbiter.

Also, Prof. V. I. Moroz has been named co-principal investigator for that instrument. In addition, IKI will provide a Lidar atmospheric sounder as part of the science package on the 1998 Mars Surveyor lander.

In September 1995, the U.S./Russian Executive Joint Working Group on Space Science agreed to study the potential for a joint Mars mission in 2001. The basic concept calls for a U.S. orbiter or lander, mated with a Russian descent module containing a Marsokhod rover, all launched on a Russian moderate-sized launch vehicle. The study is currently on-going with emphasis on the technical interfaces and requirements on both sides.

The President's FY 1997 budget submission shows the Mars Surveyor program fully funded to the levels set in FY 1995. The Mars Together option is fully contained within the Mars Surveyor Program budget. In short, there is no change in funding requirements whether the program is done jointly with Russia or as a

U.S.-only endeavor. There are, however, significant potential science gains should the Mars Together plan materialize.

Origins

QUESTION 26:

a: . Is Origins a part of New Millennium?

ANSWER 26a:

No, the two programs are separate, but the New Millennium Program will develop some key technologies that will likely benefit future Origins missions, as well as most other future Space Science and Earth Science missions.

QUESTION 26:

b. If not, where will NASA get the funds to start origins?

ANSWER 26b:

The goals of the Origins program are to search for planetary systems, terrestrial-sized planets, and eventually to determine the habitability of these planets around nearby stars. The current budget requests for both space science and space access and technology fund several key initiatives that will support the Origins program in the next few years:

An Interdisciplinary Research & Analysis (R&A) program is addressing the fundamental science of Origins (Origins of the Solar System).

The Hubble Space Telescope (HST) continues to observe the processes of stellar and planetary formation.

NASA's Space Science and Space Access and Technology offices are working together in ongoing concept and technology studies to investigate how best to accomplish the goals of the Origins Program and what advanced technologies are required to bring the concepts to reality. Among the concepts and associated technologies currently being funded are: lightweight, low-cost mirrors, telescope designs and new spacecraft technologies for a Next Generation Space Telescope.

The Keck II observatory and the Palomar Interferometer, two world-class ground facilities, are developing technology for ground-based interferometers looking for Jupiter size planets, and searching for planetary disks. Some of the technologies and lessons learned on the ground should be applicable to large, space-based interferometers capable of searching for Earth-sized planets.

The New Millennium Program will likely include a future flight test of key interferometer technologies in space.

The Space Infrared Telescope Facility (SIRTF) will search for planetary disks, planetary dust, and Jupiter-sized planets around other stars.

Additional enhancements to the Origins program, that could start in the next decade but which are not included in the budget through 2001, include a Space Interferometry mission and a Planet Finder Interferometer. These concepts are clearly not well enough defined nor understood and significant study and advanced technology development is required before such missions will be proposed for funding. The New Millennium program will develop and test key technologies which will contribute to the formulation of these missions.

NASA's Office of Space Science (OSS) will consider the priority of any new "origins" missions and decide whether the missions should be proposed. Our decisions on individual missions will be made over the next few years in full consultation with the National Academy of Sciences.

QUESTION 26:

c. Do they expect to see an increase in space science funding after the year 2000?

ANSWER 26c:

The Origins science theme is currently supported through funding of a number of research and flight programs in Space Science. No flight program specific to Origins is expected until the beginning of the next decade. The future outlook at the moment is sufficiently uncertain in that we have no particular expectation at this moment beyond FY 1997.

QUESTION 26:

d. How can origins be a new start in FY 2000 in the space science budget when the total NASA budget is $11.6 billion and space science is not a protected White House priority?

ANSWER 26d:

No new start for an Origins specific mission is currently planned for FY 2000. NASA will continue to assess Origins mission requirements and to develop concepts and technologies which could support this science theme. If, over the next few years a new mission is defined, and the concept and technologies are sufficiently mature to allow consideration as an FY 2000 new start, this mission would compete with other priorities for whatever resources are available in future budgets.

SCIENCE INSTITUTES

QUESTION 27:

Is NASA trying to "outsource" its science? Where will NASA get the startup funds for the institutes? Is NASA expecting to save any money by implementing the science institutes?

ANSWER 27:

A significant fraction of NASA science is already "outsourced." The majority of our Principal Investigators are from the academic community. NASA employs an open, competitive, peer-review process to select investigations.

Institutes are proposed as a means for preserving and/or improving NASA's contributions to national science in the face of reductions in the size of the federal work force. It is essential that NASA remain at the forefront of the space sciences, while at the same time coupling its efforts more closely with other researchers and educators.

Startup funds for the Institutes will come from the existing NASA program budgets.

NASA currently projects that the Institutes will be revenue neutral.

The Institutes, along with the Agency's other major reinvention and streamlining efforts, represent a positive response to the Administration's budget challenges in the coming years to achieve savings and to reduce infrastructure rather than programs.

QUESTION 28:

In a meeting of the NASA Advisory Council last year, members were concerned that the Science Institutes were a way to push space science out of the Agency. How do NASA's priorities coincide with the Administration's priorities?

ANSWER 28:

Institutes are proposed as a means for preserving and/or improving NASA's contributions to national science. In the current environment, NASA's ability to conduct viable research programs is at risk. NASA is exploring the institute concept as a way to achieve better integration of NASA science with science in the larger scientific community. One purpose is to preserve key capacities while recruiting a broader range of talent to our scientific tasks. The Science Institutes are a method for producing better science.

NASA is attempting to look beyond Agency downsizing or cost savings and to take a positive step toward establishing a new model for managing NASA's research program. We feel the Institutes are the best way to adhere to Administration and NASA priorities and, at the same time, downsize the federal workforce.

The Agency is prepared to proceed with a limited number of Institutes in the near-term and will assess the success of these efforts before proceeding further. The three Institutes selected for near-term implementation focus on disciplines in the life and microgravity sciences.

Zero Base Review

QUESTION 29:

How has the scientific community reacted to the restructuring of the Office of Space Science, with the restructuring abolishing the traditional discipline-based divisions (solar system exploration, astrophysics and space physics) with a cross-cutting, theme based organization? What effect do you expect to see from this restructuring in terms of how university scientists, for example, interact with NASA and this Congress in arguing in favor of specific space missions?

ANSWER 29:

The Office of Space Science (OSS) has worked carefully with the scientific community -- particularly its major Advisory Committee, the Space Science Advisory Committee (SScAC), and with the National Academy's Space Studies Board -- in implementing the restructuring of OSS. The Committees have understood the rationale for the change and have been very supportive of the direction that OSS is going. At its most recent meeting, for example, SScAC reviewed the status of the new organization with the Associate Administrator and the Science Board of Directors and stated that "SScAC was very pleased by the overall philosophy evident in the presentations of the Board of Directors and the Chairs of their Subcommittees. It is clear from the emphasis on inter-disciplinary research, on inter-connecting among the four themes and with other NASA enterprises, and on outreach to the various constituencies outside of NASA, that the Board members are fully aware of the benefits that can accrue from the restructuring of OSS and are committed to ensuring success in the new circumstances." With the new focus on cross-disciplinary approaches, and a more distributed approach to managing OSS and receiving advice from the community, there should, in fact, be more opportunities for university scientists to interact with NASA. Congress should expect new missions to have an even broader base of support than they have had in the past when advocacy came from a much narrower more discipline-oriented community.

ADVANCED SPACE TRANSPORTATION:
REUSABLE LAUNCH VEHICLE

Overall RLV Program/Funding

QUESTION 30:

Mr. Goldin, in recent months you have made several passionate speeches about the importance of slashing the high cost of space transportation, and the critical role of the X-33 program in achieving that goal.

- But the White House has not protected the X-33 or the RLV program against its projected outyear budget cuts.

- Does the White House fail to understand how important cheap access to space is?

ANSWER 30:

The Administrator has testified that the RLV program is the highest priority NASA program aside from Shuttle safety. The program has received strong support in the President's budget and we expect this priority and support to continue. Progression of the RLV program beyond the current fiscal year is contingent upon a White House decision to proceed to Phase Two. NASA believes it has met the decision criteria which in turn should provide the basis for continued support for this vitally important national program.

QUESTION 31:

You've worked very hard to find the resources within a declining NASA budget to first set up and now "front load" the X-33 program.

a. Given OMB's priorities for NASA, will you be able to continue the current program as planned, or might it be cut or stretched out later this decade?

ANSWER 31a:

There are no plans at NASA to "stretch out" or slow the RLV program in any manner. NASA is moving forward in our partnership with industry to do the cutting-edge research required to provide our nation with a reliable, affordable means of access to space. The RLV program's DC-XA, X-34, and X-33 are experimental vehicles designed to reduce the technological risk to a level sufficient for development of a full-scale, orbital RLV.

QUESTION 31b:

How would a stretch-out impact plans for the Space Shuttle?

- If there is no alternative vehicle that could fulfill the Space Shuttle's missions, how do we keep the aging Shuttle fleet going beyond 2012?

- Won't such a life-extension require a similarly large U.S. government investment?

ANSWER 31b:

Consistent with National Space Transportation Policy, NASA is committed to maintain and safety fly the Space Shuttle through the design life of the International Space Station (2012). To accomplish this, we will make selective improvements to increase efficiency, reduce costs, improve safety and enhance performance to meet mission requirements. Depending on the decision in the 2000 timeframe to replace the Space Shuttle, the Program will explore the feasibility of operating the current fleet significantly beyond 2012.

DC-XA

QUESTION 32:

Just recently NASA's upgrade of the popular DC-X, to the DC-XA, was rolled out of its hangar and shipped to New Mexico for flight testing. Its final Defense Department flight was last July, which means that the NASA-industry team rebuilt the DC-XA in just eight months.

a. When was the last time NASA introduced a new vehicle that quickly, and what was it about this program that produced such fast results?

ANSWER 32a:

The DC-XA , as the vehicle identification implies, is not a new vehicle per se. NASA has upgraded the existing vehicle with advanced technology such as the graphite composite intertank, the Aluminum-Lithium liquid oxygen tank, composite feed lines, and a new aeroshell. Credit for the fast turn around should be given to an experienced contractor team which is tightly focused, lean, and results-oriented. They are used to being asked to deliver on short notice and thrive on the challenge to do so. NASA management has been kept to the minimum to accomplish the tasks at hand much as the program was managed by DoD previously. These factors account for fast results.

X-34

QUESTION 33:

Since last fall's hearing on the X-34, the original industry team has dropped out of the X-34, and NASA has issued a new announcement requesting bids on a purely experimental vehicle.

a. What is the purpose of that new vehicle?

b. Should the X-34 test technologies that contribute to the X-33 itself, or alternative technologies?

c. Does the X-34 experience make you uneasy about the industry's ability to carry out the X-33 program, which is also under a "cooperative agreement" framework?

ANSWER 33abc:

The purpose of the X-34 is to bridge the gap between the subsonic DC-XA and the hypersonic X-33. We must demonstrate, at hypersonic speeds, operability of technologies that are crucial to an RLV. We need to fly often to understand how new technologies degrade by use and exposure to real world conditions over time. We want to fly through rain and land in cross winds exceeding 20 knots. We want the operations data base that both vehicles will provide to understand the issues of operating a later RLV. We expect that some of the embedded technologies in X-34 will be relevant to X-33. We also expect to retrofit X-34 after the initial series of flight tests, and to conduct a follow-on series of flight tests to determine alternative technology applications that X-33 does not demonstrate. We will also at this time be able to address technology or operational issues that will inevitably arise during the first series of flight and ground tests.

The X-34 experience so far has taught us several things. First, trying to combine research and development needs with commercial needs in the same vehicle is too difficult a task. Secondly, we learned that it is critical that all partnerships and subordinate contractors be locked in by the signatory company prior to the government signing on the dotted line of a cooperative agreement. We have applied these lessons to the X-33 process. We said that X-34 would be a pathfinder in the use of new management models and it served its purpose in that regard and will continue to do so in the future. Industry's ability to carry out its end of the bargain is the same as ours; it is based on a clear understanding of the milestones and goals we expect to achieve as a team working toward a common purpose.

X-33

QUESTION 34:

X-33 has been front-loaded in this budget, in response to appeals by NASA's partners under the cooperative agreements, and this committee, too.

a. What have the contractors done in terms of front-loading their commitments to this program?

b. When will NASA know if the contractors are serious about investing in X-33 and the whole RLV concept?

c. What are you expecting from the contractors?

ANSWER 34abc:

Until we have had an opportunity to review, select, and negotiate one of the proposals by the contractors, it would be speculative to comment on what commitments contractors will offer during the bidding and negotiation process. One part of the proposal requirements is for the bidders to offer a decision plan which will include criteria they believe must be fulfilled prior to proceeding with full scale development of the next generation launch system. This will be an early indicator or "test" of corporate commitments and intentions.

QUESTION 35:

Last November, Mr. Brown suggested that the X-33 might be a good candidate for a multi-year authorization. Would that help NASA accomplish its important objectives for the X-33?

ANSWER 35:

Since payment milestones for Phase 2 of the X-33 will be negotiated prior to selection, stable funding is needed. The more stability perceived in the program by the private sector, the less risk is perceived by a Board of Directors.

QUESTION 36:

In recent months you've been somewhat critical of the U.S. rocket industry, and have pushed the X-33 contractors to be more aggressive, both financially and technically. What's been their response? Do you believe NASA will receive good proposals in May?

ANSWER 36:

NASA believes the contractors have accelerated their pace and honed their focus as the deadline for proposing has drawn nearer. The latest round of reviews of the work being accomplished is heartening and impressive in its depth of detail. There are strong indications that we will be faced with a difficult decision in late June because of the quality of the effort put into the X-33 project. We relish the idea that the decision will be difficult because that means there will be good technical and business options available to us.

QUESTION 37:

One of the hallmarks of X-programs is their small, focused program offices. How successful has the X-33 team been at staying small and focused?

a. Have they been able to fight off any and all bureaucratic threats and keep on track as a team?

b. Does the X-33 have a direct reporting chain to you, and will that continue into phase 2 of the project?

ANSWER 37ab:

We began this effort based upon the notion that we would keep management to a minimum with a very short chain of command and clear accountability. It is still that way and will continue to be that way. We want industry to lead and we want to be good partners. We will not allow anything to slow the pace of this program.

QUESTION 38:

What is the current number of management layers in the X-33 program, and is that layering expected to change in Fiscal Year 1997, or anytime during Fiscal 1996?

ANSWER 38:

The X-33 program manager reports to the Space Transportation Division Director at NASA Headquarters. He works for the Associate Administrator of the Office of Space Access and Technology. They brief the Administrator on a regular basis to keep him informed on the progress of the program. At this time, we have no intention of changing this organization.

MISSION TO PLANET EARTH

QUESTION 39:

DoD Authorization precludes DoD from expending funds on the TOPEX-Poseidon Follow-On mission. How does this effect the mission's ability to meet NASA and DoD requirements?

ANSWER 39:

NASA's ability to meet science requirements for the TOPEX-Poseidon Follow-On (TPFO) mission will not in any way be affected by the withdrawal of DoD funds. The NASA science community will receive the same amount of critical oceanographic data with the same accuracy and timeliness as originally planned.

The potential benefit to DOD in participating in the TPFO mission was to provide the Navy with real-time access to TPFO data as a backup to their Geosat Follow-on mission. This real-time backup (which would have involved placing an encrypting device on the spacecraft) will now not be available. However, the Navy will continue to have access to all of the TPFO data (although not in real-time) just as they do now with TOPEX/Poseidon data.

QUESTION 40:

NASA's response to an Inspector General report on the Fairmont, WV facility for Mission to Planet Earth indicated that NASA would move the facility's Data Production Facility (DPF) functions to a facility at White Sands, NM, but that the permanent selection of a site for DPF functions would wait until the selection of downlink technologies for Mission to Planet Earth spacecraft. Since NASA has selected a prime contractor for the EOS common spacecraft award, does it plan to locate future DPF functions at White Sands or Fairmont?

ANSWER 40:

Though NASA has chosen TRW to be the prime contractor for the EOS common spacecraft, the contract was under protest for the last 7 months which forced NASA to issue a stop work order for the first EOS common spacecraft (EOS-PM1). The protest was resolved on April 15, 1996, when GAO ruled in NASA's favor of selection of TRW. We can now begin the appropriate studies to determine the most efficient way to downlink the data. If the use of TDRS continues beyond the AM-1 mission, then we would continue to locate consolidated DPF functions at White Sands. If a downlink to ground stations is chosen, then the DPF functions would probably be performed at Goddard Space Flight Center.

QUESTION 41:

The Inspector General found last fall that the Office of Mission to Planet Earth was inappropriately using NASA funds to expand a Department of Interior (DOI) facility at the EROS Data Center (EDC). NASA's Office of Mission to Planet Earth disagreed with the IG's findings. What is the status of this issue?

ANSWER 41:

In its original response to the draft IG report, NASA reiterated that it did not agree with the IG's interpretation of the language from the FY 1994 Appropriations Conference report. In July 1995, NASA officially requested a clarification from the Committees on Appropriations regarding the intent of the language in the 1994 report and outlined NASA's position on the issue. In our December 15, 1995, official response to the IG on the audit report, NASA stated that "since OMTPE [the Office of Mission to Planet Earth] has received no response [from the Congress] indicating that our interpretation is incorrect, we will continue to assume that the language 'construction of facilities' does not mean lease of facilities." That continues to be NASA's position on the issue.

QUESTION 42:

How much has the EOS spacecraft schedule slipped as a result of the contractor protest of the award of the common spacecraft contract?

ANSWER 42:

The EOS-PM spacecraft had a built-in 6 month schedule reserve which was completely depleted as of last month due to the protect. On April 15, 1996, the GAO ruled in favor of NASA's selection of TRW. As a result of that decision we anticipate no direct schedule impact, although we would initiate discussions with the contractor to restore some schedule reserve. If the protest continues for much longer, additional funding would be needed to speed up the schedule to continue to maintain a December 2000 launch.

QUESTION 43:

By how much has the cost of EOS risen as a result of the protest? If the cost of EOS has not risen, please explain what savings NASA identified in the program that enabled it to counter the cost increases associated with contract delays.

ANSWER 43:

The cost impact of the delay in the Common Spacecraft procurement protest will not be known until we have completed negotiations with the selected contractor regarding ways to build schedule reserves back into the program (e.g., parallel tasks, optimizing test times, etc.). Because there was schedule reserve built into the original contract, we believe that the cost impact of the delay will not be significant.

QUESTION 44:

What steps has NASA taken to redesign the Chem-1 spacecraft and how has this changed the spacecraft's projected costs?

ANSWER 44:

A study is currently underway to evaluate options for the Chem-1 mission. A more aggressive infusion of new technology is being considered to further reduce costs.

The study is scheduled to be briefed to NASA senior management in late April, 1996. Since some options involve potential modifications to schedule and science return, the science community will be engaged to ensure that requirements continue to be met in a balanced manner. Following the completion of this review, we will inform Congress of the results and any changes in program plans.

QUESTION 45:

The press and NASA have indicated that the last reshaping effort for Mission to Planet Earth (MTPE) identified savings within the program that have been redirected to the Earth Systems Science Pathfinder (ESSP) program and New Millennium Program (NMP) for earth science. By how much was NASA able to reduce the project cost of Mission to Planet Earth between FY 1996 and FY 2000 (inclusive) in order to fund the Pathfinder program and earth science components of New Millennium? Please provide this information by fiscal year and programmatic source of the savings, including a summary of any technical or management changes within the program that reduced its costs.

ANSWER 45:

The FY 1997 budget request reflects several programmatic and budget changes that resulted from both the comprehensive review of Mission to Planet Earth (MTPE) that was conducted in 1995, as well as Agency-level reviews. The major changes include the reshaping of the Earth Observing System (EOS) Flight and DIS programs, the clearer definition of a previously planned science and technology infusion effort for EOS/MTPE, and a decision by the agency to augment planned spending for the Earth System Science Pathfinder (ESSP). These changes allowed Mission to Planet Earth to move boldly forward with ESSP and the Earth science element of the New Millennium Program (NMP) and to restore some previous reductions in the MTPE Research and Analysis program.

Reshaping. The reshaping of the EOS Flight and DIS programs resulted in savings of $265 million in the FY 1996 through FY 2000 timeframe. These savings consist of $182 million in EOSDIS (which is composed of $155 million in project savings and $27 million in savings at Headquarters; these changes are described in the answer to question 48), and $83 million in the flight program. The flight program changes include the incorporation of advanced technology to reduce instrument, spacecraft, and launch vehicle costs, and resizing of program reserves consistent with the new program approach.

Investing in the Future. As part of its FY 1996 budget request, NASA had incorporated a general funding line (FY 1998: $20 million; FY 1999: $40 million; FY 2000: $60 million) designed to ensure the vitality of future science and technology infusion in EOS (this was tentatively described in terms of an Announcement of Opportunity). As a result of the review of the EOS reshape activity, NASA determined that the specific execution of this concept would come in the form of Earth science elements of the New Millennium Program (which will produce the advanced technologies that will help reduce the costs of EOS by about 30% in the post-FY 2000 timeframe) and the ESSP program (which will enable NASA to address emerging areas of science that are not currently addressed by EOS).

Added Agency Funds. Reflecting the high priority within the agency for the ESSP and NMP programs, NASA decided to increase the FY 1997 request for these programs by $50 million ($20 million in FY 1997 and $30 million in FY 1998) through a realignment of funding plans within NASA.

Bolster Science. In addition to the NMP and ESSP programs, the savings identified above were also used to partially restore previous cuts in the Research and Analysis program. As a result of the shift, the FY 1997 request reflects a an annual level of $145 million per year for R&A, which is critical if NASA is to have the necessary scientific capability to take full advantage of the wealth of information that will be generated by EOS and other observation and analysis programs.

QUESTION 46:

Please describe in detail the current restructuring of the Earth Observation System Data Information System (EOSDIS) and compare the costs of the reshaped program through FY 2000 with the program's costs through FY 2000 as they were projected in the FY 1996 budget request before NASA initiated an EOSDIS reshaping.

ANSWER 46:

EOSDIS funding through FY 2000 was $2,231 million in the FY 1996 budget request (prior to the reshape). The FY 1997 budget request includes an estimate of $2,049 million (including $894 million through the end of FY 1996) for the same period, yielding a reduction of $182 million. This reflects a $155 million reduction in project funding and a $27 million reduction in Headquarters activity.

The $155 million in project savings were achieved through several changes. The most significant changes include consolidation of the networks into one system (EBNet, EOSDIS backbone network) and implementation of selective data requests which will reduce demand on the network. DAAC-to-DAAC circuits were consolidated and availability of circuits was brought into line with science product delays. The savings also assume a 10% per year circuit rate decrease. The EOS Data and Operations System (EDOS) configuration was consolidated at White Sands while maintaining a back-up archive at Fairmont, West Virginia. Performance requirements, development methodology, and reliability, maintainability, and acceptability requirements were reevaluated and in some cases reduced. The DAACs operating costs were reduced 20% by consolidating some of the DAAC/EOSDIS Core System (Hughes) operations functions. Other changes include providing additional automation in the flight operations control center to allow reductions in the second and third shifts, and reductions in contractor support for systems engineering and integration.

The $27 million in Headquarters savings reflect the net effect of several minor program adjustments and the redistribution of EOSDIS program reserves, in large part to help bolster the MTPE Research and Analysis program.

QUESTION 47:

Please provide a list of all parties (commercial enterprises, universities, non-profit corporations, and non-NASA Federal Government entities) now under contract to do work on EOSDIS that were not under contract to do work on EOSDIS prior to the current reshaping.

ANSWER 47:

There have been no changes to the EOSDIS contractors as a result of the current reshaping activity.

QUESTION 48:

Has NASA used of any of the $695 million carried over from FY 1995 to FY 1996 to reduce the amount requested for Mission to Planet Earth in FY 1997? If so, please identify the program within Mission to Planet Earth for which this was done.

ANSWER 48:

After adjustments are made for uncosted Construction of Facilities funding and undistributed funds, the total amount of uncosted funding carried over from FY 1995 to FY 1996 by Mission to Planet Earth is $695 million. We have applied $53.8 million of program uncosted to reduce our FY 1997 request. The distribution of this uncosted adjustment is as follows:

	NOA in FY$M
Total	-53.8
EOSDIS	-18.8
Algorithms	-11.0
PM Series	-10.0
AM Series	-6.0
CHEM Series	-4.0
TOPEX MO&DA	-3.0
UARS MO&DA	-1.0

QUESTION 49:

How did the $653 million carried over from FY 1995 to FY 1996 accumulate?

ANSWER 49:

As noted in the previous answer, the level of uncosted funds at the end of FY 1995 was $695 million. At the time these funds were carried over from FY 1995 to FY 1996) September 30, 1995), $203 million was unobligated (though as of the end of February 1996, that figure was down to $51 million). All programs have a level of uncosted as a result of the time lags between receiving appropriations, authorizing work and completing it, and as the result of changing plans. Congress recognizes this and allows NASA two years to obligate these funds.

In 1995, the level of uncosted funds increased by about $200 million due to management action to restrain the program in view of the uncertainty of outyear funding. These were prudent management actions associated with extensive review being done by the National Research Council and basic issues being raised by our Congressional committees. In 1995 the EOS program was conducting the most recent in a series of program restructurings intended to enable the program to accomplish its objectives in a more constrained budgetary environment. This series of restructurings has resulted in reductions in EOS from an original estimate of $17 billion (through FY 2000) to the current estimate of $6.8 billion for the same period. As a result management restrained program activities until a new baseline was established, thereby contributing to the growth in the uncosted.

There are factors in other areas of the program that contribute to the growth in uncosted funds. For example, in the Mission Operations and Data Analysis (MO & DA) area, projects are funded assuming a discrete lifetime. Projects are encouraged to commit funds as late as possible due to the uncertain nature of the lifetime.

In addition to the flight and ground program, MTPE funds an extensive amount of scientific research. Its scientific research and analysis activities are accomplished under a peer-reviewed grants process, with thousands of grants going to scientific investigators at universities, foundations, institutes, and other organizations. The peer review process occurs throughout the year. Many of the grants are awarded late in the year; consequently much of the work occurs in the following fiscal year, which is when the costs will be recorded. Until the work is performed and invoiced, the funds remain uncosted.

The current uncosted level is high, driven by uncertainty in near-term and future budgets and prudent management action to delay work as long as possible; often the delayed work costs more and managers normally try to avoid delays. Our current planning provides for utilization of the uncosted to fund baseline work. In FY 1996 our baseline plans include a reduction in the uncosted by $125 million by the end of the year.

QUESTION 50:

In requesting and receiving its FY 1995 budget for Mission to Planet Earth during calendar year 1994, NASA reportedly knew how it would spend the funds received. Since the government shutdown occurred after FY 1995 ended and NASA made no significant changes to the EOS baseline (EOS and EOSDIS) during FY 1995 that would warrant taking half of the MTPE budget off-line, what events in FY 1995 prevented NASA from spending funds equal to approximately half of its annual budget for Mission to Planet Earth during FY 1995?

ANSWER 50:

As indicated in the previous answer, all programs have a level of uncosted as a result of the time lags between receiving appropriations, authorizing work and completing it, and as the result of changing plans. The uncosted has accumulated since the beginning of the Mission to Planet Earth program but grew in FY 1995 due to management action associated with extensive review being done by the National Research Council and basic issues being raised by our Congressional committees. This was basic management prudence in the face of uncertainty.

QUESTION 51:

As of March 27, 1996, how much did NASA expect to carry-forward from FY 1996 to FY 1997?

ANSWER 51:

As of March 27, 1996, MTPE plans to carry forward about $570 million from FY 1996 into FY 1997, or $125 million less than it entered the year with.

QUESTION 52:

The Mission to Planet Earth request for FY 1997 includes $50 million for purchasing Earth remote sensing data. How will NASA use these funds?

ANSWER 52:

NASA will soon release a Request For Information (RFI) for data purchases to the commercial community. The key element of the RFI is to explore the willingness of industry to accept a major portion of the upfront financial risk as a new way of doing business with the Government. After we analyze information from the private sector, we can use an appropriate procurement vehicle to request competitive bids for a data purchase which will meet the science needs of the Mission to Planet Earth program.

AERONAUTICS

QUESTION 53

The Advanced Subsonic Technology (AST) program has been referred to as "corporate welfare" because it invests in incremental improvements on current technology for the benefit of industry rather than research that pushes the outer edges of aeronautics technology.

a: Can you tell us why this program has attained protected status as one of the Administration's five priorities for NASA?

ANSWER 53a:

The Advanced Subsonic Technology (AST) program makes technology investments in areas where industry will not, such as safety, environment, productivity, and high-risk technology.

The AST program is an integral part of the overall NASA aeronautics research and technology program. Industry has consistently listed AST and the High Speed Research program as their highest priority technology development programs within the NASA aeronautics program.

The AST program specifically addresses future technology needs in the next-generation subsonic aircraft (from large commercial jets to small general aviation aircraft) and the evolving aviation system. NASA's role is to develop, in concert with government and industry partners, high-risk, high-payoff pre-competitive technologies so that industry can continue technology development and apply it to specific commercial products. NASA focuses our AST investments in four key areas: safety, environment, capacity, and economics. These investments will provide a future payoff to the U.S. economy by addressing problems such as congestion and delays in our national aviation system which cost $4 billion per year and a declining U.S. share of the world commercial transport market.

QUESTION 53bc:

Can you explain why you would terminate the Hypersonic Research and Technology Base program next year, a cutting edge aeronautical research program, and protect programs which are merely financial support to industry?

ANSWER 53bc:

NASA has not abandoned our commitment to basic hypersonic research and technology development. NASA has begun to refocus our research efforts in the Research and Technology Base program toward demonstration of advanced technologies and development of low-cost Experimental Aircraft. This program will incorporate aggressive, affordable design and manufacturing technologies to produce flight validated, lower-risk technologies. In fact, our hypersonic technology investment in FY 1997 has actually increased from our FY 1996 level, with more emphasis on flight research.

This re-focused R&T Base program will continue to be a foundation for longer-term, basic technology development for application by industry during the coming decades. NASA is shifting the focus of the R&T Base toward more customer-oriented basic research and technology development. This basic technology research is vital to the future of our aviation industry. In fact, one will likely find today's discoveries from the R&T Base incorporated on a future commercial transport aircraft in the year 2026.

The FY 1997 Administration request is for $ 354.4 million for the Research and Technology Base. These funds will be invested in basic, long-term research in the following technical disciplines: airframe systems, propulsion systems, aviation operations and safety, flight research, information technology, and rotorcraft research.

QUESTION 54:

Your testimony states that over the next 20 years, the subsonic aircraft market is estimated at $800 billion. The total Advanced Subsonic Technology program runout in this budget is projected at over $1.6 billion.

a: Why should the taxpayer be asked to provide this investment for the big aircraft corporations if the market is so lucrative?

b: Do you consider Advanced Subsonic Technology to be a higher priority than the Research and Technology Base?

ANSWER 54ab:

NASA's Advanced Subsonic Technology program is a legitimate and high priority use of federal R&D funds. The program will ultimately provide a pubic good as well as contribute to the long-range economic competitiveness of the United States. Aviation, of which the subsonic market is overwhelmingly the largest portion, is one of the United State's most successful industries with sales exceeding $90 billion, a $30 billion positive balance of trade, and almost 1 million high-skilled jobs.

As mentioned above, the AST program invests in high-risk, high-payoff pre-competitive technologies which will ensure continued U.S. leadership in aviation. NASA's AST investments focus on four key areas: safety, environment, capacity, and economics. Industry typically underinvests in long-term research in these areas because of an inability to capture a return on this investment.

With respect to our customer's priorities, late last year the Aeronautics Enterprise completed its triennial customer survey. This survey of 78 direct and indirect aeronautics customers found strong support for the overall aeronautics program. The survey responses indicated that industry's priorities are the following: #1, HSR; #2, AST; and #3 the Research and Technology (R&T) Base. All are critical for a balance aeronautics program.

QUESTION 55:

Your testimony states further that the potential market for the High Speed Civil Transport (HSCT) is $200 billion. The total program runout for High Speed Research is $1.8 billion.

a: Should the taxpayer provide this level of funding when the returns for industry are so great?

ANSWER 55a:

Yes. Without NASA's investment in High Speed Research, a High Speed Civil Transport market will not develop; or worse - foreign competitors may dominate the market. Moreover, the NASA investment is in high-risk, pre-competitive enabling technologies which will enable our industry partners to make a business decision whether to produce a viable High Speed Civil Transport (HSCT).

Currently, several "environmental barrier issues" exist that prevent industry from committing to the development of an HSCT. These issues are: potential damage to the atmosphere from aircraft engines; unacceptable noise levels en route resulting from "sonic booms"; and unacceptable take-off and landing noise levels in the immediate vicinity of airports. Unless it can be demonstrated that technology solutions exist to alleviate these barriers, industry will never be in a position to consider the potential development of an HSCT. These environmental issues are appropriate areas for investment of government research dollars.

It is also not possible to develop an economically-viable HSCT based on current technology. A substantial investment in developing new, high-risk technologies is required before any company can make an aircraft development decision. The resources required to undertake this initial technology development effort (roughly $5 billion), coupled by the fact that financial returns from actual aircraft sales are still relatively far in the future, support an important government investment role in the development of these high-risk technologies.

QUESTION 55b:

Why won't the major aircraft corporations invest this money if they claim the market for this aircraft will exist?

ANSWER 55b:

Industry is not in an economic position to solely invest in this pre-competitive, basic research due to its high risk and uncertain payoff. Nevertheless, the U.S. major aircraft and engine manufacture companies are spending large amounts of their own resources toward HSCT technology development. Industry continues to exceed the government investment in the HSR program. By the end of the initial technology development phase, industry will have expended approximately $3 billion versus $1.8 billion of NASA funding.

QUESTION 55c:

Can you assure us that when the HSR program is completed that the taxpayer will not be asked to foot the bill for NASA to build an expensive prototype for industry?

ANSWER 55c:

The High Speed Research Program is organized to provide the enabling, critical technologies to U.S. industry so that it can make a business decision whether to produce a viable HSCT by the year 2005. While a decision will need to be made at the completion of the HSR program as to whether all technology issues have been resolved, NASA will not fund a prototype vehicle.

QUESTION 55d:

Since the projected markets for these aircraft are so profitable, shouldn't the taxpayer be reimbursed by industry for the vast amounts of money that they have invested?

ANSWER 55d:

As mentioned earlier, NASA's investment in the HSR program is in pre-competitive, basic research. Industry is not currently in an economic position to solely invest in this research due to its high-risk and uncertain payoff. However, the taxpayers could re-coup a large amount of the their initial investment if a successful HSCT is developed by industry. Market analysis show a potential of 140,000 new, high-skilled jobs and $200 billion in revenue if U.S. industry produce a HSCT. These new jobs and sales revenue will generate significant returns to the U.S. economy and U.S. Treasury.

QUESTION 56:

The FY 1997 budget for NASA poses a significant threat to the health of the agency's future in aeronautics. As focused programs conclude in the first years of the next decade, there appears to be no vision within the budget document for what direction America's aeronautical research will go in the next decade.

a: Will all that remains of aeronautics research be the Research and Technology Base, or will other programs be created that might be seen as the next generation of corporate welfare?

ANSWER 56a:

Other programs will be created as NASA priorities as budgets and national requirements permit. Studies and customer discussions are currently being conducted to assist in defining new program directions and strategic investments.

At the top level, two major areas require attention. First, pioneering research to provide more aeronautical principles to support an affordable access to space will be important in the next decade. Example of such principles are: technologies for airbreathing hypersonic propulsion and high utilization vehicle technologies. Second, a sustainable integrated civil aviation transportation technology program is critical. New research to benefit and enable safety, the environment, and overall economy will be required to maintain the U.S. preeminence in aviation manufacturing and operation.

QUESTION 56b:

Should the overall agency budget decline to the projected FY 2000 levels, how will NASA justify its present levels of funding in aeronautics?

ANSWER 56b:

As with the current aeronautics program, the justification will be made based on our future program's economic and technological benefits to our customers, stakeholders, and to the nation as a whole. These benefits will be balanced with other administration goals and priorities in an effort to produce a balanced aeronautics technology program.

QUESTION 56c:

When programs such as Advanced Subsonic Technology and High Speed Research conclude will the agency shift its focus to increased hypersonic research or other cutting edge aeronautical initiatives?

ANSWER 56c:

As mentioned above, two major areas require attention. First, pioneering research to provide more aeronautical principals to support an affordable access to space is very important. Second, a sustainable integrated civil aviation transportation technology program is critical.

QUESTION 57:

NASA's May 1995 Zero Base Review recommended that the agency should consolidate their research aircraft at one center to reduce the cost of flight operations. This measure would move aircraft from Lewis, Langley and Ames Research Center as well as the Wallops Island facility to the Dryden Flight Research Center in California.

a: What is the status of that consolidation?

ANSWER 57a:

Planning for aircraft consolidation is proceeding. No aircraft or personnel have been moved. A final decision based on cost and other factors such as the realignment of center roles and responsibilities should be made in the next few weeks.

QUESTION 57b:

The NASA Inspector General issued two reports on the feasibility of this initiative. Can you tell us what data was utilized for the second report which changed the recommendation?

ANSWER 57b:

The NASA Inspector General is reviewing aircraft consolidation. However, no report has yet been issued. The two reports referenced are most likely the working draft and final independent cost assessment of aircraft consolidation performed by the NASA Comptroller. The widely-quoted late 1995 "report" was an initial working draft which did not contain substantiating program office data. This draft was used for review and to stimulate the submission of more accurate data. The February 1996, Comptroller's final report substantiated what prior studies had found -- savings would accrue through aircraft consolidation at the Dryden Flight Research Center.

QUESTION 57c:

What additional facilities, if any, will have to be constructed at Dryden to support this move?

ANSWER 57c:

No facilities will have to be constructed at Dryden to support this move. This is a major departure from prior studies which identified the requirement for over $30 million in construction for additional hangar, office and shop space. This requirement has been satisfied at an annual cost of about $650,000 because the Air Force Flight Test Center (AFFTC) has made the C-17 hangar complex available as a part of the Dryden - AFFTC alliance, a win-win situation.

QUESTION 57d:

How will NASA change the way it performs research in conjunction with these aircraft to realize the savings you propose?

ANSWER 57d:

The savings will accrue primarily because fewer people, aircraft and equipment will be needed at the single location. Currently, research aircraft operate from five locations. Management, maintenance, quality control, flight operations and support personnel are required at each location. Proficiency and research support aircraft, aircraft ground equipment, test equipment, spare parts and other supplies are at each location. Operations from a single location are much more cost effective. Operations and maintenance personnel can be applied across a broader base of aircraft, fewer proficiency and support aircraft (and associated personnel) are required, and synergy is possible in aircraft selection for research experiments. It should be noted that the savings accrue only when all aircraft are consolidated; leaving a few at other locations requires the addition of significant infrastructure at each location, thereby eliminating the synergy of consolidation.

One concern that some raise is that consolidation will damage flight research because "the researchers will not be where the aircraft are." This is not the norm even today. Less than 21 percent of all aeronautics flight research is performed by researchers who are collocated with the aircraft. Forty percent of the scientists conducting aircraft-based microgravity research at the Lewis Research Center (OH) come from outside the local area. Only 17 percent of the Earth-system science airborne research at the Ames Research Center (CA) is executed by Ames personnel, and many of these flights are from remote locations. Most Wallops Flight Facility (VA) aircraft-based science research is conducted at remote locations such as Iceland.

Advances in information technology are already helping us develop new models for research operations. For example, the F-18 High Angle-of-attack Research Vehicle program currently being conducted at Dryden is led by the Langley Research Center (VA). Langley personnel participate in the research flights in real time through the "virtual control room" data link with Dryden.

QUESTION 58:

Your testimony refers to the Federal Aviation Administration as a "customer" of NASA. Do you intend to seek reimbursement for all research activities NASA performs for the FAA?

ANSWER 58:

No. The FAA and NASA act as partners in developing technologies which benefit the national aviation system. Currently, we have five large cooperative programs: Advanced Air Transportation Technology, noise reduction, aging aircraft, wake vortex, and Center-Tracon Automation System. Both organizations coordinate closely in a number areas and sit on each other's advisory boards to ensure no duplication of effort and the most efficient use of tax dollars. NASA primarily performs concept exploration and concept development and then transfers the technology to the FAA. However, if the FAA requests that NASA continue development into the prototype or full-scale development phase, the FAA does reimburse the cost of these activities to NASA.

FIXED ASSETS

QUESTION 59:

What does the $900 million for fixed assets consist of? Is the Committee expected to authorize $900 million more for NASA in FY 1997? In the OMB big budget book, NASA is mentioned in two different places, with apparently two separate $900 million requests. One is for TDRSS and the New Millenium program and one is for Space Station, Shuttle upgrades, Cassini, AXAF, and EOS. Can you please explain? Is NASA requesting $1.8 billion beyond the $13.804 billion request?

ANSWER 59:

As part of the ongoing effort to improve planning and budgeting for the acquisition of fixed assets and similar procurements, the President's FY 1997 budget includes a separate allowance to provide full upfront funding for certain projects, which would otherwise have been funded incrementally. This allowance is included as part of the Government-wide general provisions in the Appendix of the budget.

The incremental budget authority required in FY 1997 for NASA projects in this category is requested as part of NASA's FY 1997 budget. The additional post-FY 1997 amounts of budget authority required for full funding are requested in the separate Government-wide general provision. As part of that allowance, NASA is requesting a total of $900 million in upfront funding --$342 million for the New Millennium Initiative and $558 million for the Tracking and Data Relay Satellite (TDRS) replenishment. The upfront funding for the New Millenium Initiative is the outyear budget needed to provide the life-cycle cost, including spacecraft development, launch, mission operations and data analysis for five space missions. The upfront funding for TDRS replenishment is the outyear budget for the procurement of the three spacecraft and the associated launch services. This funding would help maintain the cost advantage of this unique fixed price contract and could also better enable the eventual commercialization of the space network.

Upfront funding will enable better cost conrols and savings through improved planning and greater management flexibility and accountability. Authorization of this funding as well as appropriation of the FY 1997 request as well as the remainder of the full funding request will be necessary.

Responses to written questions submitted by Cong. Weldon resulting from the March 28, 1996, hearing.

QUESTION 1:

Using the figures in the attached chart (provided by Mr. Goldin during a March 28, 1996 meeting) please show the breakdown of all civil service and contractor job tasks at Johnson Space Center, Kennedy Space Center, and Marshall Space Flight Center by function of department (management, engineering, quality, training, materials etc.). Please provide this information from FY 1995 through FY 2000. Also, please indicate how many employees from each function over this period are most likely to transition to United Space Alliance.

ANSWER 1:

Enclosure #1 includes the information you requested. Planned civil service staffing levels by Budget Line Item is included for the Kennedy, Marshall and Johnson Space Flight Centers. For FY 1998-2001, these are tentative staffing levels and do not represent the NASA budget totals included for those years in the President s budget request. Also include in Enclosure I are planned contractor levels for the centers for FY 1996 through FY 2000. These are consistent with the Zero Base Review recommendations.

For the Space Shuttle program, the majority of civil servant reductions are due to the changing civil servant roles from the day-to-day management of operations (currently an oversight role), to providing insight into contractor performance and returning to focusing more on research and development activities. The streamlining of requirements will also reduce civil servant involvement.

The actual number of current Space Shuttle civil servant positions to be transferred to the Space Flight Operations contract is under review and subject to negotiation with the SFOC contractor.

QUESTION 2:

NASA's own internal findings recommend conducting OMDP processing at KSC instead of Palmdale. Please provide rationale for conducting Endeavour's OMDP at Palmdale. What is the next step in this decision process? What role will United Space Alliance play in the final decision? Please provide a copy of the NASA inspector General report on this matter.

ANSWER 2:

Endeavour (OV105) is scheduled to undergo OMDP as well as Space Station modifications following its June 1996 flight. After reviewing the work required, the Space Shuttle Program Manager decided the Endeavour work would be accomplished at Palmdale. His reasons were:

--Mods are extensive and require a long, uninterruptible period.

--Performing the mods at KSC would threaten the FY 1997 Space Shuttle flight manifest.

> --The intrusiveness of the work is more similar to that found in vehicle manufacturing than vehicle processing and should be accomplished by a dedicated team as opposed to the KSC shared-resource approach.
>
> --Endeavor mods are similar to those currently being accomplished at Palmdale on Discovery. Discovery departs the facility in late June. Endeavour would arrive early August. Use of Palmdale provides continuity of the modification workforce and affords the advantages of an experienced workforce.

Budget allocations assumed the Endeavour OMDP at KSC and will be adjusted to Palmdale rates.

In August 1996 the Space Shuttle Program Manager will conduct a review prior to deciding where OMDP will be performed on Atlantis --- the next orbiter in line for major modifications. The Space Flight Operations contractor will be involved in this review.

Per your request, we have attached the NASA Inspector General's report entitled, "Impacts of Performing Orbiter Maintenance Down Periods at KSC versus Palmdale," as Enclosure #2.

QUESTION 3:

What is the status of the Department of Defense request to fly a payload on the Space Shuttle?

ANSWER 3:

On March 7, 1996, NASA formally notified the DOD that it could launch the proposed NASA/DOD cooperative Shuttle Radar Topography Mission (SRTM) in late FY 2000. Because this is later than the DOD requested launch date of late FY 1998, NASA advised the DOD that it will continue to examine alternatives for an earlier launch opportunity. As of this date, the DOD has not formally responded to this proposal.

In addition, NASA is currently participating in a joint review with the DOD, investigating the cost savings benefit to the taxpayer of transferring some primary DOD payloads to the Shuttle manifest, no earlier than CY 1999.

QUESTION 4:

To the extent the Shuttle becomes increasingly managed by the private sector, will NASA conduct a review reevaluating the national policy prohibiting commercial payloads from flying on the Shuttle? When will this begin and who will be doing the review?

ANSWER 4:

In the new Space Flight Operations Contract, Request for Proposal (RFP), the contractor is tasked to develop "a plan for potential privatization of operations systems and services and /or involvement of commercial customers of the Space Shuttle." If the plan proposes changes to the current Shuttle Use Policy, NASA will confer with the Administration and the Congress regarding potential changes.

The current policy for use of the Shuttle which was adopted by NASA following the Challenger disaster and enacted into law by the FY 1991 Authorization Act prohibits use of the Shuttle for payloads, commercial or government, that could be launched by other means. This policy permits commercial payloads that require human involvement or other unique capabilities of the Shuttle. The Intelsat VI rescue and reboost in 1992 was a commercial mission. In addition, other primary and secondary payloads developed under NASA's space commercialization program have flown on the Shuttle.

Even with increased private sector involvement in its management, the Shuttle will remain a national asset whose manifesting will be done by NASA subject to national policy until otherwise determined by Congress and the Administration. At the present time, NASA does not envision a reexamination of the policy.

QUESTION 5:

In the March 25, 1996, issue of Aerospace Daily, Mr. Goldin says that another X-vehicle may need to be built to prove the technology for single stage to orbit in order to generate sufficient confidence and support in the investment community. Under what circumstances would NASA need to consider an additional X-vehicle? What are the cost and schedule implications of an additional X-vehicle program?

ANSWER 5:

There is a direct correlation between the risks NASA and industry accept in the X-33 and X-34 vehicles and the cost of any subsequent privately developed Reusable Launch Vehicle (RLV). The greater the risks we accept in our current X-vehicles, the lower the total development cost of a later RLV will be. This relationship is mitigated by our need to build X-vehicles that succeed in demonstrating their imbedded technologies in flight. Thus it would be imprudent to simply build the riskiest X-vehicles possible, as such vehicles would have a high probability of not proving their technologies.

It could be the case that the most prudent X-vehicles (those that maximize technological advance while minimizing the risk of flight failure) will fail to satisfy the capital markets requirements for risk reduction relative to an investment of the size required to develop an RLV. In that case, NASA would need to consider whether to build on the success of the X-33 and X-34 programs with a follow-on effort to prove still more advanced technologies and operations concepts. This "generation after next" effort could be conducted by modifying the X-33 and X-34 vehicles, or by development of a new X-vehicle.

Cost and schedule implications of a possible follow-on vehicle cannot be estimated until the test results of the X-34 and X-33 programs begin to indicate the type of follow-on vehicle, if any, that will be needed.

QUESTION 6:

What is the status of the management changes altering the role of Headquarters and the field centers? Provide written descriptions of the new roles and responsibilities of Center Directors? Please provide new organization charts detailing the Headquarters, Johnson Space Center, Kennedy Space Center, and Marshall Space Flight Center staffing assignments for Shuttle and Space Station programs.

ANSWER 6:

The detailed instructions concerning organization structure at Headquarters and the NASA Centers has not been finalized. Implementing instructions will take into account outside advisory reports, including the National Academy of Science and the Aerospace Safety Advisory Panel, and consultation with our partners in our unions. Until that time, all current organization structures will remain in place.

Headquarters Enterprise Associate Administrators will continue to be responsible for program formulation, long term institutional investment strategies, and external advocacy. They will articulate the strategy for their areas of responsibility consistent with the Strategic Plan. They will also establish policy, define requirements and objectives, allocate resources, assess performance, and are the NASA internal customer. Enterprise Associate Administrators will advocate for and allocate resources for the full cost of their programs, including personnel and facilities.

Headquarters will determine “what” the Agency does and “why”, and assess customer requirements and satisfaction. It will be the external interface, representing the ultimate customers. The Strategic Plan and specific Enterprise Plans will define the broad framework. Where Enterprises are supported by multiple Headquarters organizations, a Lead Associate Administrator will be appointed who will be responsible for coordinating policy and requirements guidance for the Enterprise. Headquarters Enterprise Associate Administrators may designate an individual at Headquarters to sponsor specific programs in accomplishing the Headquarters duties defined above. This individual would assume the role previously filled by either Program Directors or Program Managers.

Enterprise Associate Administrators will continue to assess the performance of the Center Directors assigned to them, consistent with the current Institutional Program Office structure.

Center Directors will assume significantly more responsibility for program management. They will continue to determine the “how” programs get done. The level and number of Headquarters-controlled items will be held to an absolute minimum, consistent with external statutory and regulatory requirements. All program implementation responsibilities previously retained at Headquarters will be assigned to Center Directors. Enterprise Associate Administrators will configure programs supported by multiple Centers so that they can be more efficiently and effectively accomplished within the framework of Lead Center assignments. This identification will be consistent with the Centers Missions identified during the ZBR. Again, Lead Centers are different from Centers of Excellence in that they support specific programs. A designated Center of Excellence provides an Agency technical competence that crosses programs. The Lead Center Director will have full management responsibility and authority and thus full accountability for assigned programs, ensuring that they are being managed to agreed upon scheduled milestones, budget guidelines, technical requirements and all safety and reliability standards. Within an Enterprise, Lead Center Directors will determine how the work gets done, including negotiating and assigning work to other NASA Centers. Headquarters Enterprise Associate Administrators will delegate to the Lead Center Directors all of the program and institutional implementation flexibility they have currently been delegated by the Administrator and/or the Chief Financial Officer/Comptroller. A Program Manager will be designated by and report to the Lead Center Director. Center Directors, consistent with our dedication to empowerment, will delegate management and responsibility to the Program Managers that report to them. If individual project elements exist within a program, they will report to the Program Manager.

QUESTION 7:

The Space Station Program has adopted a very detailed metrics program in tracking program progress and problems. How has this program enabled NASA to predict program problems before they occur? Please submit the latest metrics report as well as one for 1994 & 1995.

ANSWER 7:

Program metrics are tools used by Space Station managers to assist them in evaluating program performance. Program metrics consists of measurements of performance parameters (such as cost, weight, power, schedule, etc.) which are derived for each specific area of management responsibility, or, they may be specially developed to satisfy unique and specific requirements.

An up-to-date program status is determined through analyses of predicted vs actual performance values using the latest technical and program performance data. For evaluating future performance, *planned* values and *forecasted* values of performance are derived from metric data using models, statistical analyses, and management judgment. These values are then compared to preset variances or margins to identify unhealthy trends or projected impact problem areas. Using slices of this data across the program, managers can assess the various relationships between costs, schedules and selected technical data to derive the cause and effect relationships needed to formulate and direct corrective action. In this fashion managers can predict problems and evaluate whether the program is headed in the right direction to achieve expected performances and fulfill the program cost and schedule objectives.

Enclosed are performance measurement reports for the International Space Station (ISS) over the June 1995 to February 1996 time period (Enclosure #3). The information consist of three overlapping groups of data from June 1995 through November 1995; August 1995 through January 1996; and September 1995 through February 1996. The time periods are marked on each page of the data.

Please note that the non prime contractor plotted data does not reflect monthly performance information before October 1995 because performance metrics were not provided by the program on a month to month basis before that time. This is one of the many changes that has taken place as the program has evolved and is an example of the fact that we continue to improve our management and tracking of performance data.

This material represents top level performance parameters reflecting our progress towards meeting our baseline performance targets. Total monthly performance metrics for the program are quite extensive. However, additional metrics can be provided if desired.

The acronyms represent:

BCWS	Budgeted Cost of Work Scheduled or the planned earned value of the task.
BCWP	Budgeted Cost of Work Performed or the "earned value" of the work performed on the task. Equals Percent Complete x Baseline Cost.
ACWP	Actual Cost of Work Performed. Total cost actually incurred for the task. SV Earned Value Schedule Variance, which is the difference between the earned value of the work performed (BCWP) and the earned value of the work that had been planned to be performed (BCWS).
CV	Earned Value Cost Variance, which is the difference between the earned value of the work performed (BCWP) and the ACWP.
CPI	Cost Performance Index. Equals cumulative BCWP divided by cumulative ACWP
SPI	Schedule Performance Index. Equals cumulative BCWP divided by cumulative BCWS
CTD	Cumulative to Date

QUESTION 8:

How has the integrated product team approach benefited the Space Station program?

ANSWER 8:

We definitely plan to continue to use Integrated Product Teams. While we have found that the IPT approach requires more up front planning and training to set the process up effectively, it has increased organizational synergy, led to better, more substantive definition of products and services and allowed delegation of authority to lower levels. We have found areas where horizontal integration and communication could be improved on and are modifying processes to enhance effectiveness in these areas. However, the benefits realized from this approach outweigh any problems we've seen to date.

QUESTION 9:

What are benefits of flying two additional Shuttle missions to the Russian Mir Space Station?

ANSWER 9:

The Russian partnership in the ISS program helps us to accelerate the assembly timetable and to avoid substantial development cost in the area of propulsion and navigation. It also allows us to better prepare for Station assembly and provides us with additional research opportunities on Mir. It is in our interest to reach an agreement with the Russians that mutually beneficial and within the resources and capabilities of both nations. During the Russian negotiations, it became evident that the Russians would have major difficulties in meeting their earlier commitments. The two additional flights will assist the Russians in achieving those commitments as well as provide us with an expansion of the insights gained in our phase 1 activities. We believe we have reached an agreement that was in the best interest of both parties.

QUESTION 10:

What NASA objectives could be met, if any, by designating KSC as an alternative launch site for Russian launch vehicles? More specifically, would there be any benefit to the Space Station program if Russian launch vehicles (i.e. Proton) could be launched from KSC?

ANSWER 10:

NASA is aware of the interest the Spaceport Florida Authority and Lockheed have shown in the potential of launching Russian vehicles from KSC. However as the only Space Station elements scheduled for launch on Russian launch vehicles are those of the Russian contributions, it is not evident that using KSC as an alternate launch site would be of benefit. Additionally, because of the lower inclination of KSC from that of the Russian launch site of Balkinor, there is approximately a 13,000 pound reduction in performance of these vehicles in reaching the station orbit from the lower inclination of KSC. The launch vehicle is always of considerably greater mass than the elements to be launched. As such, it appears that the logistics involved would be of considerably greater than simply shipping launch elements to Russia where the necessary integration personnel and facilities already reside anyway. Having to duplicate this capability in the U.S. would be a significant deterrent to implementation of this idea.

Purpose: Representative Weldon Briefing meeting with Mr. Goldin

UNDER CONSIDERATION

FY 1997 BUDGET TO CONGRESS	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY95 BASE CS/SSC REDUCTION	FY 95 BASE CS/SSC PCT. REDUCTION
TOTAL JSC/KSC	29560	27674	25842	24598	22698	21845	-7715	-26%
CIVIL SERVANTS	5890	5773	5681	5496	4690	4335	-1555	-26%
SUPPORT SERVICE CONTRACTORS	23670	21901	20161	19102	18008	17510	-6160	-26%
JOHNSON SPACE CENTER	16543	16449	13994	13113	12092	11705	-4838	-29%
CIVIL SERVANTS	3530	3503	3429	3273	2976	2908	-622	-18%
SUPPORT SERVICE CONTRACTORS	13013	11946	10565	9840	9116	8797	-4216	-32%
KENNEDY SPACE CENTER	13017	12225	11848	11486	10606	10140	-2877	-22%
CIVIL SERVANTS	2360	2270	2252	2223	1714	*1427*	*-933*	*-40%*
SUPPORT SERVICE CONTRACTORS	10657	9955	9596	9262	8892	8713	-1944	-18%
SPACE STATION PROGRAM	4257	4177	4272	4210	3978	3430	-827	-19%
CIVIL SERVANTS	961	1170	1249	1262	1189	973	12	1%
SUPPORT SERVICE CONTRACTORS	3296	3007	3023	2948	2789	2457	-839	-25%
JOHNSON SPACE CENTER	3431	3403	3407	3264	2970	2624	-807	-24%
CIVIL SERVANTS	780	975	1042	*1054*	*979*	*839*	59	8%
SUPPORT SERVICE CONTRACTORS	2651	2428	2365	2210	1991	1785	-866	-33%
KENNEDY SPACE CENTER	826	774	865	946	1008	806	-20	-2%
CIVIL SERVANTS	181	195	207	208	210	134	-47	-26%
SUPPORT SERVICE CONTRACTORS	645	579	658	738	798	672	27	4%
SPACE SHUTTLE PROGRAM	17248	16043	14932	14586	13778	13449	-3799	-22%
CIVIL SERVANTS	2243	2149	2051	2069	1621	1467	-776	-35%
SUPPORT SERVICE CONTRACTORS	15005	13894	12881	12517	12157	11982	-3023	-20%
JOHNSON SPACE CENTER	8446	7763	6931	6674	6370	6218	-2228	-26%
CIVIL SERVANTS	1225	1219	1121	1046	940	914	-311	-25%
SUPPORT SERVICE CONTRACTORS	7221	6544	5810	5628	5430	5304	-1917	-27%
KENNEDY SPACE CENTER	8802	8280	8001	7912	7408	7231	-1571	-18%
CIVIL SERVANTS	1018	930	930	1023	681	*553*	*-465*	*-46%*
SUPPORT SERVICE CONTRACTORS	7784	7350	7071	6889	6727	*6678*	-1106	-14%

Chart provided by Mr. Goldin during a 3/28 mtg.

OFFICE OF SPACE FLIGHT

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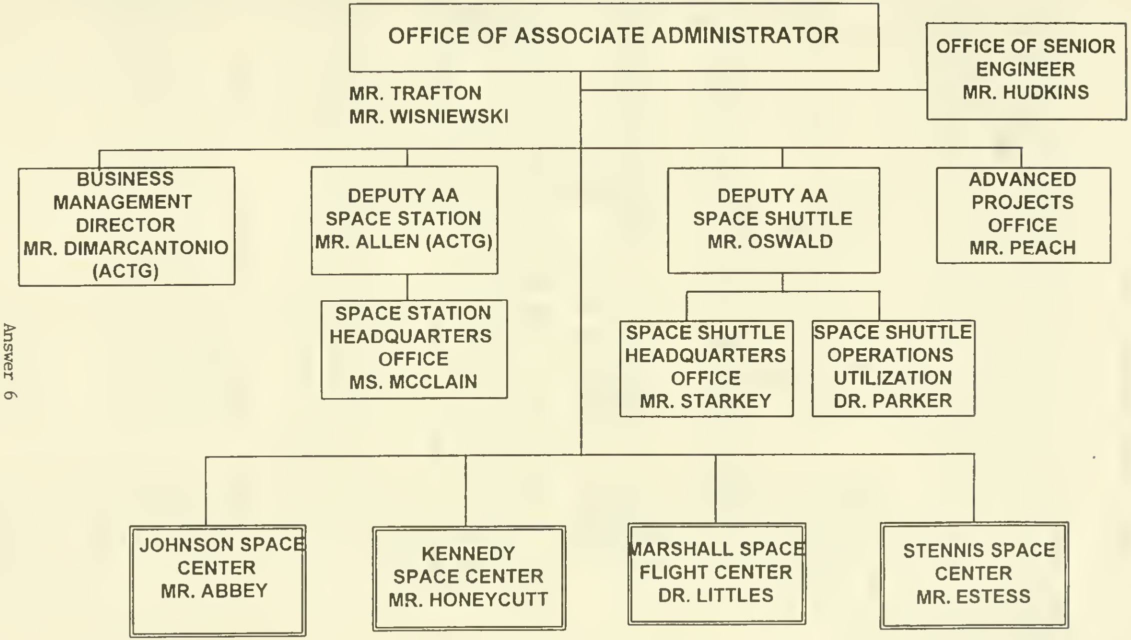

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MR. WISNIEWSKI

OFFICE OF SENIOR ENGINEER
MR. HUDKINS

BUSINESS MANAGEMENT DIRECTOR
MR. DIMARCANTONIO (ACTG)

DEPUTY AA SPACE STATION
MR. ALLEN (ACTG)

SPACE STATION HEADQUARTERS OFFICE
MS. MCCLAIN

DEPUTY AA SPACE SHUTTLE
MR. OSWALD

SPACE SHUTTLE HEADQUARTERS OFFICE
MR. STARKEY

SPACE SHUTTLE OPERATIONS UTILIZATION
DR. PARKER

ADVANCED PROJECTS OFFICE
MR. PEACH

JOHNSON SPACE CENTER
MR. ABBEY

KENNEDY SPACE CENTER
MR. HONEYCUTT

MARSHALL SPACE FLIGHT CENTER
DR. LITTLES

STENNIS SPACE CENTER
MR. ESTESS

Answer 6

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503 LYNDON B. JOHNSON SPACE CENTER (JSC)

a. CENTER MISSION. The Lyndon B. Johnson Space Center, located in Houston, Texas, advances the national capability for human exploration and utilization of space by research, development, and operation of the Space Shuttle, the Space Station, and to other space systems, and by developing and maintaining excellence in the fields of project management, space systems engineering, medical and life sciences, lunar and planetary geosciences, and crew and mission operations.

b. RESPONSIBILITIES. The Director, Johnson Space Center (JSC), is responsible for the following:

(1) Manages and supports space vehicle and space systems development programs as follows:

(a) Manages assigned Space Shuttle development and production projects and provides subsystem managers and associated continuing engineering support.

(b) Provides institutional support to the Space Station Program Office (SSPO), a Headquarters office located at JSC, and manages assigned Space Station technical tasks.

(c) Plans, defines, and develops the programs, projects, and technologies critical to both the Agency and JSC future role in space utilization and exploration.

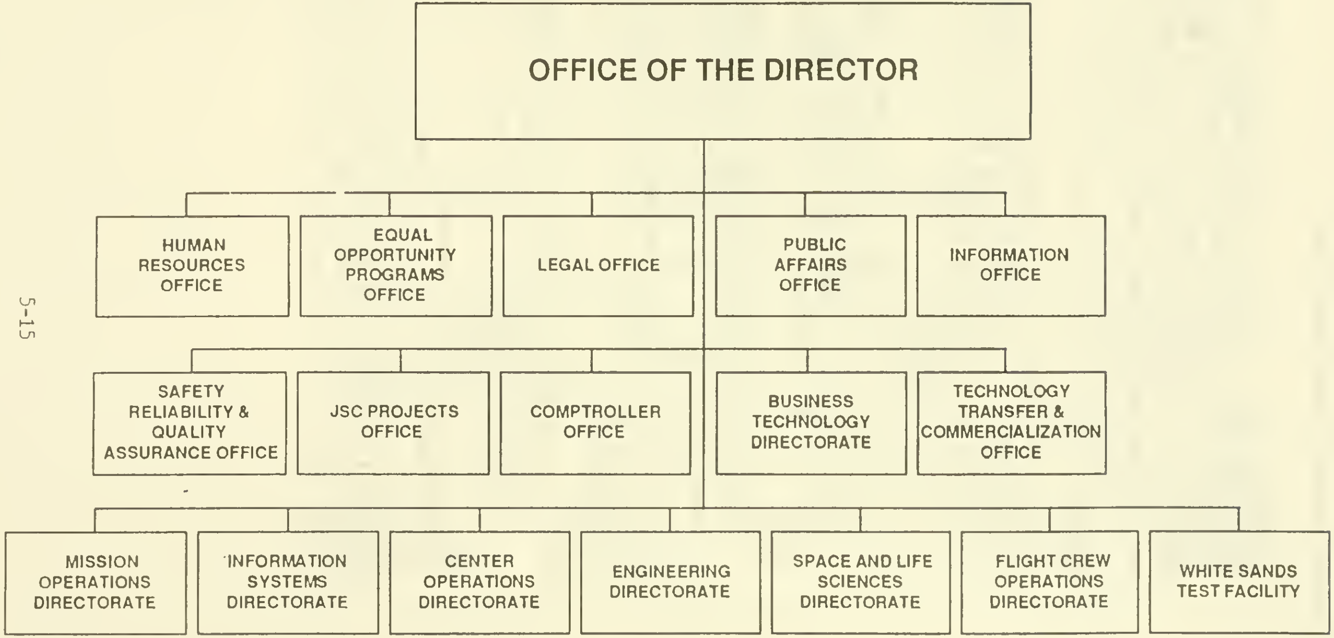
(2) Plans and conducts space flight, crew, and aircraft operations as follows:

(a) Conducts flight operations for the Space Shuttle and provides operations support for the SSPO, including providing the flight and support environment to satisfy mission objectives and assure mission safety.

(b) Manages flight crew operations including selection and training.

(c) Conducts aircraft operations in support of astronaut flight readiness training, high-altitude research, zero-g flight evaluations, orbiter transportation, Agency logistics, and administrative functions.

LYNDON B. JOHNSON SPACE CENTER
(JSC)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MISSION OPERATIONS DIRECTORATE
INFORMATION SYSTEMS DIRECTORATE
CENTER OPERATIONS DIRECTORATE
ENGINEERING DIRECTORATE
SPACE AND LIFE SCIENCES DIRECTORATE
FLIGHT CREW OPERATIONS DIRECTORATE
WHITE SANDS TEST FACILITY

504 JOHN F. KENNEDY SPACE CENTER (KSC)

a. CENTER MISSION. The John F. Kennedy Space Center, located in Kennedy Space Center, Florida, assembles, integrates, and checks out the Space Shuttle elements and payloads, including the Spacelab, Space Station, and upper stages, and conducts launch, recovery, and landing operations. It also provides Government oversight of NASA expendable vehicle launches and NASA-sponsored payloads.

b. RESPONSIBILITIES. The Director, Kennedy Space Center (KSC), is responsible for the following:

(1) Designs, constructs, operates, and maintains space vehicle facilities, ground-support equipment, and associated software required for launch and recovery operations, including development of new launch and recovery operations concepts, techniques, and associated hardware.

(2) Operates and maintains ground-support equipment, facilities, and logistics support for all NASA activities at Kennedy Space Center, Cape Canaveral Air Force Station, Vandenberg Air Force Base, and worldwide contingency and secondary landing sites.

(3) Manages and operates Space Shuttle flight hardware spares and logistics functions and services at KSC and certain logistics services for other NASA Centers and NASA activities at various Air Force locations.

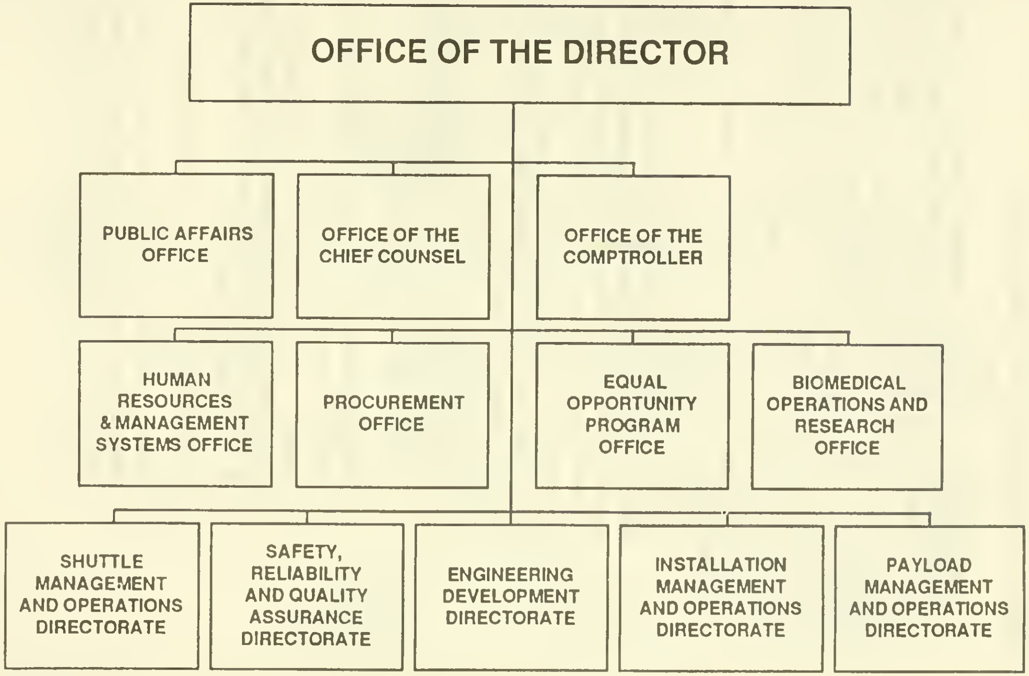
(4) Conducts the final preparation and integrated checkout of vehicle, spacecraft, payloads, launch facilities, ground support equipment, and launch and recovery operations.

(5) Provides support and expertise to the Space Station program in the areas of preflight and launch operations, logistics, maintainability, resupply, and customer utilization.

(6) Manages propellant consumables for NASA and liquid hydrogen for all Government agencies.

c. SPECIAL RELATIONSHIP. Serves as the NASA point of contact with the 45th Space Wing and 30th Space Wing and provides, through intercenter agreement, the Goddard Space Flight Center (GSFC) interface with the 45th Space Wing on network matters.

JOHN F. KENNEDY SPACE CENTER
(KSC)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BIOMEDICAL OPERATIONS AND RESEARCH OFFICE
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SAFETY, RELIABILITY AND QUALITY ASSURANCE DIRECTORATE
ENGINEERING DEVELOPMENT DIRECTORATE
INSTALLATION MANAGEMENT AND OPERATIONS DIRECTORATE
PAYLOAD MANAGEMENT AND OPERATIONS DIRECTORATE

507 GEORGE C. MARSHALL SPACE FLIGHT CENTER (MSFC)

a. CENTER MISSION. The George C. Marshall Space Flight Center, located in Huntsville, Alabama, is the principal NASA Center for design, development, integration, and test of propulsion systems, launch vehicles, and space transportation systems, including propulsive stages for orbital transfer and deep space missions. It develops, integrates, and operates astrophysics, space physics, and microgravity sciences payloads and experiments. It has a supporting role in developing capabilities in the astronomy, astrophysics, and Earth sciences disciplines. It is the prime Center for integrated payload utilization across all science disciplines.

b. RESPONSIBILITIES. The Director, MSFC, is responsible for the following:

(1) Develops a broad-based research and development capability consistent with the assigned responsibilities to include the definition of program requirements; systems engineering and analysis; technology development and transfer; design, development, integration, and testing; and operations.

(2) Plans, executes, and manages assigned projects and supporting research and technology, including the requisite acquisition process for the following activities:

(a) Designs, develops, integrates, and tests the propulsion systems, launch vehicles, and space transportation systems, including propulsive stages for orbital transfer and deep space mission.

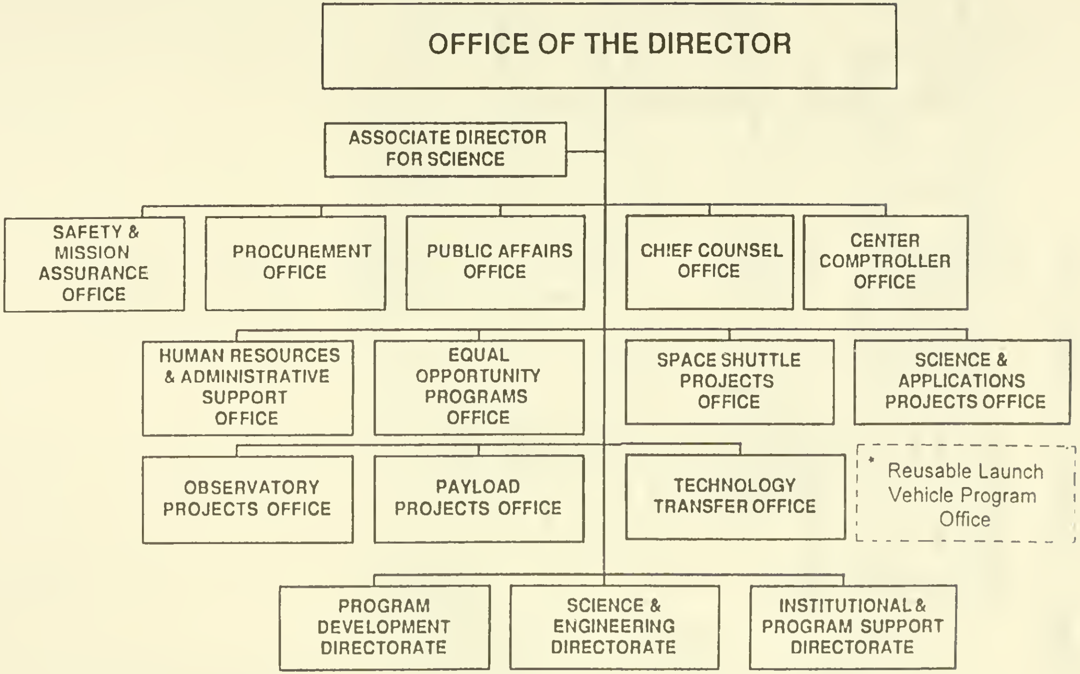
(b) Designs and develops complex and specialized automated spacecraft.

(c) Defines and develops science and applications investigations and experiments, including development of the NASA materials science and biotechnology processing in space activity base.

(d) Designs and develops manned vehicle systems.

(e) Manages spacecraft missions, including design, development, testing, and sustaining engineering of payload carriers; payload definition; integration of science and applications payloads into payload carriers; and operation of the integrated payload carrier systems.

MARSHALL SPACE FLIGHT CENTER
(MSFC)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SPACE SHUTTLE PROJECTS OFFICE
SCIENCE & APPLICATIONS PROJECTS OFFICE
OBSERVATORY PROJECTS OFFICE
PAYLOAD PROJECTS OFFICE
TECHNOLOGY TRANSFER OFFICE
* Reusable Launch Vehicle Program Office
PROGRAM DEVELOPMENT DIRECTORATE
SCIENCE & ENGINEERING DIRECTORATE
INSTITUTIONAL & PROGRAM SUPPORT DIRECTORATE

* This office reports directly to the Office of Space Access and Technology at Headquarters.

508 JOHN C. STENNIS SPACE CENTER (SSC)

a. CENTER MISSION. The John C. Stennis Space Center, located in Stennis Space Center, Mississippi, operates, maintains, and manages a world-class propulsion testing capability for the development, certification, and acceptance testing of the Space Shuttle Main Engine. It has a supporting role in technology utilization, applications, and commercialization programs in environmental system sciences and observations, remote sensing, and image processing systems.

b. RESPONSIBILITIES. The Director, Stennis Space Center (SSC), is responsible for the following:

(1) Manages and performs propulsion test operations for the development, certification, and acceptance testing of propulsion systems, engines, subsystems, and components.

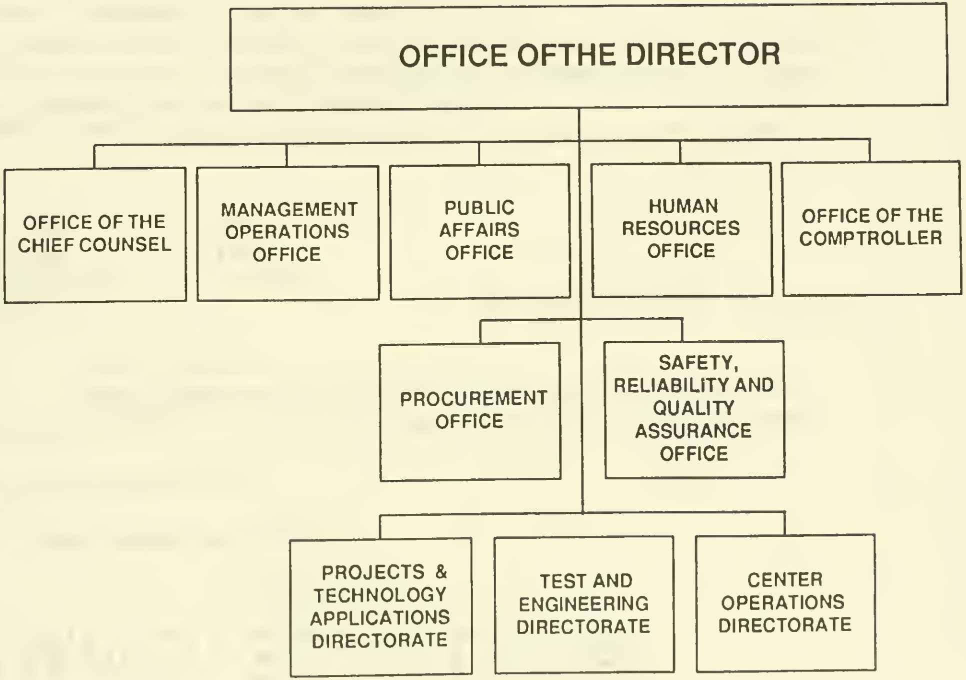
(2) Develops and conducts a research, technology, and advanced development program in propulsion test technologies to enhance safety, improve cost effectiveness, and provide high-quality test results.

(3) Conducts Earth science research and commercial remote-sensing applications and technology-transfer initiatives in partnership with U.S. industry.

c. LINE OF SUCCESSION. In the following order: Deputy Director, Stennis Space Center; Director, Center Operations Directorate; Director, Test and Engineering Directorate; Director, Projects and Technology Applications Directorate; and Director, Management Operations Office.

JOHN C. STENNIS SPACE CENTER

(SSC)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PROCUREMENT OFFICE
SAFETY, RELIABILITY AND QUALITY ASSURANCE OFFICE
PROJECTS & TECHNOLOGY APPLICATIONS DIRECTORATE
TEST AND ENGINEERING DIRECTORATE
CENTER OPERATIONS DIRECTORATE

Enclosure #1

Johnson Space Center

Houston, TX

Center of Excellence - Human Operations in Space

Mission - Human Exploration/Astro Materials

Lead Center Assignments - Space Shuttle Ops.; Space Station; Phase I Mir; Space Operations Mgmt.; Space Medicine; Space Biomedical Research; Advanced Human Support

Employment (FTE)

	Civil Service	Contractor
FY1996	3,503	11,946
FY2000 (ZBR)	2,908	8,797

FY 1997 Budget Request - $3.2 Billion

Management Actions:

- Assume mgmt. of agency space operations (include communications networks) in 1996
- Establish Biomedical Science Institute - late 1996/early 1997
- Closing Buildings/components with a current replacement value of $300 million by FY 2000; reduce facility maintenance & ops by $6 million - total of 10 engineering labs will be closed
- Terminate leased space - will save $120 million through FY 2000
- Shuttle restructuring/contract consolidation into single prime - will reduce workforce requirements by 250 equivalent personnel
- Conversion to performance based contracting (environmental, logistics, ADP, security, etc)
- Streamlined engineering and facilities p 1996-97 actions underway
- Transfer of mgmt of White Sands to Stennis Space Center (under review)

'Y 96 CONG ONAL BUDGET
'ull-Time Equ .s By BLI By Center Thru 2002
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21-Mar-96

'UDGET LINE ITEM / PROGRAM FY 1997	Congressional Budget Submit FY 95	FY 96	FY 97	Tentative Outyear Runout FY 98	FY 99	FY 2000	FY 2001
SPACE STATION	780	974	1,042	1,055	1,012	970	915
U. S./RUSSIAN COOPERATION	40	36	32	11	0	0	0
SPACE SHUTTLE	1,225	1,219	1,121	1,046	940	914	914
PAYLOAD AND UTILIZATION OPERATIONS	509	427	412	415	296	298	353
SPACE SCIENCE	34	32	30	29	25	25	25
LIFE AND MICROGRAVITY SCIENCES	174	201	212	193	179	177	177
MISSION TO PLANET EARTH	0	0	0	0	0	0	0
AERONAUTICAL RESEARCH AND TECHNOLOGY	0	0	0	0	0	0	0
SPACE ACCESS AND TECHNOLOGY	88	83	51	46	40	39	39
MISSION COMMUNICATION SERVICES	0	0	0	0	0	0	0
ACADEMIC PROGRAMS	6	6	6	6	5	5	5
SAFETY RELIABILITY AND QUALITY ASSURANCE	4	5	5	5	5	5	5
SPACE COMMUNICATION SERVICES	0	0	0	0	0	0	0
CONSTRUCTION OF FACILITIES	27	27	27	24	20	20	20
SUBTOTAL DIRECT WORKYEARS	2,887	3,010	2,938	2,830	2,522	2,453	2,453
PROGRAM MANAGEMENT (Headquarters)	0	0	0	0	0	0	0
CENTER MGMT. AND OPERATIONS	568	413	412	398	414	415	415
SUBTOTAL (FTP'S)	3,455	3,423	3,350	3,228	2,936	2,868	2,868
OTHER CONTROLLED FTE'S (OTFTP. COOPS, STUDENT AIDES)	75	80	79	45	40	40	40
TOTAL	3,530	3,503	3,429	3,273	2,976	2,908	2,908

REPRODUCED AT GOVT EXPENSE

OFFICE OF SPACE FLIGHT
FY 1997 BUDGET TO CONGRESS
SUPPORT SERVICE CONTRACT WORKFORCE FY 1996-2000
BY PROGRAM

JOHNSON SPACE CENTER	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000
TOTAL ALL PROGRAMS	11946	10565	9840	9116	8797
HUMAN SPACE FLIGHT	9970	8962	8516	7994	7647
SPACE STATION	2552	2491	2335	2081	1863
RUSSIAN COOPERATIONS	82	29	0	0	0
SPACE SHUTTLE	6544	5810	5628	5430	5304
PAYLAOD & UTILIZATION OPERATIONS	75	86	39	16	16
ENGINEERING & TECH BASE	717	546	514	467	464
SCIENCE, AERONAUTICS & TECHNOLOGY	972	846	608	419	482
SPACE SCIENCE	35	36	35	26	26
LIFE & MICROGRAVITY SCIENCE & APPLIC.	892	770	533	353	416
MISSION TO PLANET EARTH	0	0	0	0	0
AERONAUTICAL RESEARCH & TECHNOLOGY	0	0	0	0	0
SPACE ACCESS AND TECHNOLOGY	45	40	40	40	40
MISSION COMMUNICATION SERVICES	0	0	0	0	0
ACADEMIC PROGRAMS	0	0	0	0	0
FUTURE PLANNING	0	0	0	0	0
MISSION SUPPORT	1004	757	716	703	668
SAFETY, RELIABILITY & QUALITY ASSURANCE	35	35	31	29	29
SPACE COMMUNICATION SERVICES	0	0	0	0	0
RESEARCH & PROGRAM MGMT (FS-41/42)	0	0	0	0	0
RESEARCH OPERATION SUPPORT	969	722	685	674	639
CONSTRUCTION OF FACILITIES	0	0	0	0	0

Revised 5/13/96 2:31 PM CSASSC1.XLS

REPRODUCED AT GOVT. EXPENSE

Kennedy Space Center

Kennedy Space Center, FL

Center of Excellence - Launch and Cargo Processing Systems

Mission - Space Launch

Lead Center Assignments - Spacelab and Payload Processing and Support

FY 1997 Budget Request - $1.3 Billion

Employment (FTE)

	Civil Service	Contractor
FY1996	2,270	9,955
FY2000 (ZBR)	1,360*	8,713

Management Actions:

- Transition Shuttle operations Civil Service workforce to contractor workforce consistent with 1996 award of consolidated contract - Approx. 400 equiv. Personnel reduction by FY 2000
  * Civil Service staffing (under review)
- Phase down of Spacelab program & related activities - Civil Service workforce reduction of >250 and contractor workforce reduction of >500 by FY 2000
- Shuttle restructuring (single prime & reqmts reduction) - contractor workforce reduction of >500 by FY 2000
- Closing facilities/structures with a current replacement value of $500 million by FY 2000; Reducing maintenance and operations costs approx. $40 million by FY 2000
- Terminate leased space agreements - saving $20 million by FY 2000
- Transfer closed environmental life support system activities to JSC - by end of FY 1997

REPRODUCED AT GOVT EXPENSE

Y 96 CONG ONAL BUDGET
ull-Time Equ s By BLI By Center Thru 2002
SC

21-Mar-96

FY 1997

UDGET LINE ITEM / PROGRAM	Congressional Budget Submit			Tentative Outyear Runout			
	FY 95	FY 96	FY 97	FY 98	FY 99	FY 2000	FY 2001
SPACE STATION	181	195	207	208	210	134	134
U. S /RUSSIAN COOPERATION	0	0	0	0	0	0	0
SPACE SHUTTLE	1,018	930	930	1,023	681	382	382
PAYLOAD AND UTILIZATION OPERATIONS	433	441	441	441	338	272	272
SPACE SCIENCE	36	43	51	55	58	58	58
LIFE AND MICROGRAVITY SCIENCES	99	103	103	97	13	10	10
MISSION TO PLANET EARTH	16	19	22	24	25	25	25
AERONAUTICAL RESEARCH AND TECHNOLOGY	0	0	0	0	0	0	0
SPACE ACCESS AND TECHNOLOGY	20	14	14	14	14	14	14
MISSION COMMUNICATION SERVICES	0	0	0	0	0	0	0
ACADEMIC PROGRAMS	1	2	2	2	2	2	2
SAFETY RELIABILITY AND QUALITY ASSURANCE	5	12	11	11	11	11	11
SPACE COMMUNICATION SERVICES	0	0	0	0	0	0	0
CONSTRUCTION OF FACILITIES	28	28	28	28	15	10	10
SUBTOTAL DIRECT WORKYEARS	1,837	1,787	1,809	1,903	1,367	918	918
PROGRAM MANAGEMENT (Headquarters)	0	0	0	0	0	0	0
CENTER MGMT AND OPERATIONS	446	415	381	263	296	192	192
SUBTOTAL (FTP'S)	2,283	2,202	2,190	2,166	1,663	1,110	1,110
OTHER CONTROLLED FTE'S (OTFTP COOPS, STUDENT AIDES)	77	68	62	57	51	25	25
TOTAL	2,360	2,270	2,252	2 223	1,714	1,135	1,135

REPRODUCED AT GOVT EXPENSE

OFFICE OF SPACE FLIGHT
FY 1997 BUDGET TO CONGRESS
SUPPORT SERVICE CONTRACT WORKFORCE FY 1996-2000
BY PROGRAM

KENNEDY SPACE CENTER	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000
TOTAL ALL PROGRAMS	9955	9596	9262	8892	8713
HUMAN SPACE FLIGHT	8788	8566	8306	7997	7815
SPACE STATION	579	658	738	798	672
RUSSIAN COOPERATIONS	28	34			
SPACE SHUTTLE	7350	7071	6889	6727	6678
PAYLAOD & UTILIZATION OPERATIONS	707	696	572	365	358
ENGINEERING & TECH BASE	124	107	107	107	107
SCIENCE, AERONAUTICS & TECHNOLOGY	218	200	126	65	68
SPACE SCIENCE					
LIFE & MICROGRAVITY SCIENCE & APPLIC.	169	151	76	14	16
MISSION TO PLANET EARTH					
AERONAUTICAL RESEARCH & TECHNOLOGY					
SPACE ACCESS AND TECHNOLOGY	49	49	50	51	52
MISSION COMMUNICATION SERVICES					
ACADEMIC PROGRAMS					
FUTURE PLANNING					
MISSION SUPPORT	949	830	830	830	830
SAFETY, RELIABILITY & QUALITY ASSURANCE					
SPACE COMMUNICATION SERVICES					
RESEARCH & PROGRAM MGMT (FS-41/42)					
RESEARCH OPERATION SUPPORT	949	830	830	830	830
CONSTRUCTION OF FACILITIES					

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REPRODUCED AT GOVT EXPENSE

Marshall Space Flight Center

Huntsville, AL

Center of Excellence - Space Propulsion

Mission - Transportation Systems Development/Microgravity

Lead Center Assignments - Reusable Launch Vehicle; Expendable Launch Vehicle; Propulsion Technology/Development; Microgravity; Space Science Projects (AXAF et Al)

FY 1997 Budget Request - $2.7 Billion

Employment (FTE)

	Civil Service	Contractor
FY1996	3,157	3,023
FY2000 (ZBR)	2,519	2,068

Management Actions:

- Mothball Technology Testbed operation in 1996
- Reduce Civil Service Staffing consistent with Shuttle consolidated contract in RSRM/SRB/SSME/ET/Integration operations
- Close facilities/components/structures with a current replacement value of $600 million by FY 2000 - Yellow Creek, Santa Suzanna Test Facility, Eng. Dev. Lab, NBL, etc.
- Reduce support contractors by >900 by FY 2000
- Provide technical excellence in large optical systems/mirrors for agency
- Transfer AXAF operations to contractor facility at 1998 launch
- Conversion to performance based contracting (environmental, logistics, ADP, security, etc.)
- Assume mgmt.of Atlas class ELVs from LeRC by FY 1999 (under review)

REPRODUCED AT GOVT EXPENSE

FY 96 CONC 'IONAL BUDGET
Full-Time Eq .ts By BLI By Center Thru 2002
'MSFC

21-Mar-96

FY 1997

BUDGET LINE ITEM / PROGRAM	Congressional Budget Submit			Tentative Outyear Runout			
	FY 95	FY 96	FY 97	FY 98	FY 99	FY 2000	FY 2001
SPACE STATION	327	376	320	306	303	281	250
U S /RUSSIAN COOPERATION	0	0	0	0	0	0	0
SPACE SHUTTLE	676	629	524	276	221	215	215
PAYLOAD AND UTILIZATION OPERATIONS	196	125	195	375	327	338	468
SPACE SCIENCE	432	434	400	360	180	137	126
LIFE AND MICROGRAVITY SCIENCES	500	455	425	354	339	352	360
MISSION TO PLANET EARTH	141	117	137	117	114	115	130
AERONAUTICAL RESEARCH AND TECHNOLOGY	0	0	0	0	0	0	0
SPACE ACCESS AND TECHNOLOGY	466	527	546	660	608	582	460
MISSION COMMUNICATION SERVICES	0	0	0	0	0	0	0
ACADEMIC PROGRAMS	9	9	9	9	9	9	9
SAFETY RELIABILITY AND QUALITY ASSURANCE	4	4	4	4	4	4	4
SPACE COMMUNICATION SERVICES	14	14	14	32	32	33	33
CONSTRUCTION OF FACILITIES	0	0	0	0	0	0	0
SUBTOTAL DIRECT WORKYEARS	2,765	2,690	2,574	2,493	2,137	2,066	2,055
PROGRAM MANAGEMENT (Headquarters)	0	0	0	0	0	0	0
CENTER MGMT AND OPERATIONS	449	406	411	376	383	386	397
SUBTOTAL (FTP'S)	3,214	3,096	2,985	2,869	2,520	2,452	2,452
OTHER CONTROLLED FTE'S (OTFTP. COOPS, STUDENT AIDES)	65	61	61	63	66	67	67
TOTAL	3,279	3,157	3,043	2,932	2,586	2,519	2,519

REPRODUCED AT GOVT EXPENSE

OFFICE OF SPACE FLIGHT
FY 1997 BUDGET TO CONGRESS
SUPPORT SERVICE CONTRACT WORKFORCE FY 1996-2000
BY PROGRAM

MARSHALL SPACE FLIGHT CENTER	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000
TOTAL ALL PROGRAMS	3023	2739	2376	2220	2068
HUMAN SPACE FLIGHT	1369	1184	1101	1041	975
SPACE STATION	196	186	183	183	158
RUSSIAN COOPERATIONS	0	0	0	0	0
SPACE SHUTTLE	403	242	226	214	190
PAYLOAD & UTILIZATION OPERATIONS	110	89	17	0	0
ENGINEERING & TECH BASE	660	667	675	644	627
SCIENCE, AERONAUTICS & TECHNOLOGY	736	682	612	531	455
SPACE SCIENCE	188	173	205	150	123
LIFE & MICROGRAVITY SCIENCE & APPLIC.	347	338	245	234	203
MISSION TO PLANET EARTH	25	26	23	23	23
AERONAUTICAL RESEARCH & TECHNOLOGY	0	0	0	0	0
SPACE ACCESS AND TECHNOLOGY	148	117	111	96	78
MISSION COMMUNICATION SERVICES	25	25	25	25	25
ACADEMIC PROGRAMS	3	3	3	3	3
FUTURE PLANNING	0	0	0	0	0
MISSION SUPPORT	918	873	663	648	638
SAFETY, RELIABILITY & QUALITY ASSURANCE	2	2	2	2	2
SPACE COMMUNICATION SERVICES	280	250	50	50	50
RESEARCH & PROGRAM MGMT (FS-41/42)	0	0	0	0	0
RESEARCH OPERATION SUPPORT	623	610	600	585	575
CONSTRUCTION OF FACILITIES	13	11	11	11	11

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RESEARCH AND PROGRAM MANAGEMENT

FISCAL YEAR 1997 ESTIMATES

LYNDON B. JOHNSON SPACE CENTER

ROLES AND MISSIONS

SPACE STATION - Development of the International Space Station will provide an on-orbit, habitable laboratory for science and research activities, including flight and test hardware and software, flight demonstrations for risk mitigation, ground operations capability and facility construction, shuttle hardware and integration for assembly and operation of the station, mission planning, and integration of Space Station systems.

Space Station elements will be provided by the U. S. and our international partners. The U. S. elements include two nodes, a laboratory module, truss segments, four photovoltaic arrays, a habitation module, three pressurized mating adapters, a cupola, unpressurized logistics carriers and a centrifuge accommodation module. Various systems are also being developed by the U. S. including thermal control, life support, navigation and propulsion, command and data handling, power systems, and internal audio/video. The U. S. elements also include the FGB energy tug, being provided by a Russian firm under the Boeing prime contract, and pressurized logistics modules, provided by Italy.

Canada, the European nations, Japan, and Russia are also developing hardware for the International Space Station program. Laboratory elements will be provided by the Japanese and European Space Agencies. Canada will provide the remote manipulator system, vital for assembly of the station. The Russian Space Agency is providing experiment, power, life support and service modules, Soyuz crew transfer vehicle, and universal docking modules.

The Johnson Space Center (JSC) has lead management responsibility for the International Space Station program. In addition, specific JSC technical responsibilities include development of a set of facilities and systems to conduct the operations of the Space Station including on-orbit control of the Space Station.

The Center also provides institutional personnel as well as engineering and testbed support to the Space Station program. This includes test capabilities, the provision of Government Furnished Equipment (GFE), and engineering analysis support for the work of the prime contractor, its major subcontractors, and NASA system engineering and integration efforts.

U.S./RUSSIAN COOPERATIVE PROGRAM - JSC will continue to conduct management of the U.S./Russian Cooperative Program.

SPACE SHUTTLE - JSC has overall management responsibility for the Space Shuttle. In addition, JSC will provide development, integration, and operations support for the Mission Control Center (MCC), the Shuttle Mission Simulator

Enclosure #2

(SMS), and other ground facilities needed for Space Shuttle Operations. JSC will provide Space Shuttle operational flight program management including system integration, crew equipment modification and processing, crew training, flight mission planning and operations, and procurement of Orbiter hardware.

PAYLOAD AND UTILIZATION OPERATIONS - JSC will also conduct concept studies and development on flight systems and options for human transportation. JSC also provides support to Spacelab, the engineering and technical base, payload operations and support equipment, and advanced programs. JSC will continue management of the U.S./Russian Mir Cooperative Program

SPACE SCIENCE - The Center will support the Agency's planetary science program in the area of geosciences required to support future programs, provide curatorial support for lunar materials, assist in information dissemination, and interact with outside scientists. This research focuses on the composition, structures, and evolutionary histories of the solid bodies of the universe.

LIFE AND MICROGRAVITY SCIENCES AND APPLICATIONS - The Center will evaluate human physiological changes associated with the space flight environment and develop effective countermeasures to assure crew health and optimal performance during all phases of flight. It will define and develop on-board health care systems and environmental monitoring systems; crew medical training; ground-based medical support of missions; develop a longitudinal crew health data base; and develop medical and psychological crew selection criteria. The JSC has established a center for the support of biotechnology applications in microgravity in order to study growth factors, medical chemo/immunotherapeutic, and human tissue transplantation. These activities will be consolidated into a biomedical science institute. The Center will integrate life science flight experiments for Spacelab; operate integrated payload systems; and train mission and payload specialists in the science aspect of their missions. In addition, the JSC will provide mission integration and operations functions for experiments flown on the NASA-Mir program, including Space Shuttle flights as well as those transported via Russian launch vehicle applications.

CENTER MANAGEMENT AND OPERATIONS - Provide administrative and financial services in support of Center management and provides for the operation and maintenance of the institutional facilities, systems, and equipment.

ZERO-BASED REVIEW (ZBR) ACTIONS/HIGHLIGHTS - JSC's ZBR recommended realignments are as follows: JSC will assume the consolidation of the space shuttle contract into a single prime contractor and maximize outsourcing and commercial services. The center will also assume management of communication infrastructure to be implemented in mid-1996; streamline engineering and facilities to include civil servants, new institute employees to do in-house science, research and engineering; prime center for its enterprise role. JSC's area of excellence is Human Operations in Space. Its mission is Human Exploration and Astromaterials.

DISTRIBUTION OF FULL-TIME EQUIVALENT (FTE) WORKYEARS BY PROGRAM
JOHNSON SPACE CENTER

	FY 1995	FY 1996	FY 1997
Space Station	780	974	1,042
U.S./Russian cooperative program	40	36	32
Space shuttle	1,225	1,219	1,121
Payload and utilization operations	509	427	412
Space science	34	32	30
Life and microgravity sciences	174	201	212
Mission to planet Earth	0	0	0
Aeronautical research and technology	0	0	0
Space access and technology	88	83	51
Mission communication services	0	0	0
Academic programs	6	6	6
Safety reliability and quality assurance	4	5	5
Space communication services	0	0	0
Construction of facilities	27	27	27
Subtotal, direct workyears	**2,887**	**3,010**	**2,938**
Center management and operations	568	413	412
Program management (Headquarters)	0	0	0
Subtotal, full-time permanent (FTE's)	**3,455**	**3,423**	**3,350**
Other controlled FTEs	75	80	79
Total, full-time equivalents	**3,530**	**3,503**	**3,429**

RESEARCH AND PROGRAM MANAGEMENT

FISCAL YEAR 1997 ESTIMATES

JOHN F. KENNEDY SPACE CENTER

ROLES AND MISSIONS

SPACE STATION - The Kennedy Space Center (KSC) shares responsibility for operations capability and construction with the Johnson Space Center (JSC) to develop a set of facilities, systems, and capabilities to conduct the operations of the Space Station. The KSC will develop launch site operations capabilities for conducting prelaunch and post-landing ground operations including integrated testing, interface verification, servicing, launch activities, and experiment-to rack physical integration.

SPACE SHUTTLE - KSC has responsibility for maintaining world class excellence in launch and payload processing systems, KSC will provide Space Shuttle launch preparation, including orbiter processing, and Ground Support Equipment (GSE) logistics; and operation and maintenance of GSE.

PAYLOAD AND UTILIZATION OPERATIONS - KSC will provide support for Spacelab assembly and checkout and payload experiment integration, upper stages processing, Spacelab and ground support equipment (GSE) logistics and operations and maintenance of GSE.

EXPENDABLE LAUNCH VEHICLES - Provide government oversight of all launch vehicle and payload processing and checkout activities for all NASA contracted expendable launch vehicle and upper stage launch services both at the KSC and the Vandenburg Air Force Base.

CENTER MANAGEMENT AND OPERATIONS - The Center will provide administrative and financial services in support of Center management and provides for the operation and maintenance of the institutional facilities, systems, and equipment.

ZERO-BASED REVIEW (ZBR) ACTIONS/HIGHLIGHTS - KSC's ZBR recommended realignments are as follows: KSC will participate in the consolidation of the Space Flight operations contract and award by October 1996. KSC will assume management for all Atlas class expendable launch vehicles in June 1998. KSC's Mission and Center of Excellence is Space Launch.

DISTRIBUTION OF FULL-TIME EQUIVALENT (FTE) WORKYEARS BY PROGRAM
KENNEDY SPACE CENTER

	FY 1995	FY 1996	FY 1997
Space station	181	195	207
U.S./Russian cooperative program	0	0	0
Space shuttle	1,018	930	930
Payload and utilization operations	433	441	441
Space science	36	43	51
Life and microgravity sciences	99	103	103
Mission to planet Earth	16	19	22
Aeronautical research and technology	0	0	0
Space access and technology	20	14	14
Mission communication services	0	0	0
Academic programs	1	2	2
Safety, reliability and quality assurance	5	12	11
Space communication services	0	0	0
Construction of facilities	28	28	28
Subtotal, direct workyears	**1,837**	**1,787**	**1,809**
Center management and operations	446	415	381
Program management (Headquarters)	0	0	0
Subtotal, full-time permanent (FTE's)	**2,283**	**2,202**	**2,190**
Other controlled FTEs	77	68	62
Total, full-time equivalents	**2,360**	**2,270**	**2,252**

RESEARCH AND PROGRAM MANAGEMENT

FISCAL YEAR 1997 ESTIMATES

GEORGE C. MARSHALL SPACE FLIGHT CENTER

ROLES AND MISSIONS

SPACE STATION - The Center will provide engineering and testbed support to the program including engineering analysis in support of the station system engineering and integration effort and the work of the prime and major subcontractors. It will be responsible for developing payload utilization capabilities and managing operations payload activities.

SPACE SHUTTLE - MSFC will provide for the design, development, and procurement of propulsion elements for the space transportation system. It will study future space program activities including space transportation systems, space power and energy systems, space structures, space processing, and space science and application facilities.

PAYLOAD AND UTILIZATION OPERATIONS - MSFC will continue Spacelab mission management including design, development and testing of payload carries; payload definition; integration of science payloads into payload carriers; and operation of the payload integrated carrier systems.

SPACE SCIENCE - The MSFC will lead the development of the Advanced X-ray Astrophysics Facility (AXAF) and the Relativity Mission (Gravity Probe-B) as well as management of the Astro and Tethered Satellite shuttle payloads.

LIFE AND MICROGRAVITY SCIENCES AND APPLICATIONS - The Center will provide the fundamental science and technology for processing materials under conditions that allow detailed examination of the constraints imposed by gravitational forces. The MSFC will perform research in the areas of crystal growth, fluid physics, biophysics, solidification mechanics, chemistry and polymeric materials. The Center will integrate life and microgravity flight experiments and science and applications flight experiments for Spacelab, operate integrated payload systems, and train mission and payload specialists in the science aspects of their missions. The MSFC will also lead in the establishment of an Institute for Science including Materials Science, Biotechnology, Global Hydrology & Climate, and Astrophysics and Space Physics.

SPACE ACCESS AND TECHNOLOGY - The Center will provide propulsion and vehicle technology to reduce schedule and cost risk in the development of next generation expendable and reusable space transportation vehicles. It will develop technology in hybrid and liquid propulsion systems, advanced manufacturing processes, and vehicle materials and structures. The Center will conduct technology efforts, under cooperative agreements with the U.S. launch vehicle industry, to improve the competitiveness of current systems.

MISSION TO PLANET EARTH - The MSFC will conduct theoretical, field, and laboratory experimental research in the global weather, severe storms, and local weather areas in order to improve the understanding of severe storms, local and global scale weather systems

MISSION/SPACE COMMUNICATION SERVICES - Manage and maintain the Program Support Communications Network (PSCN) which provides communications hardware, software, and transmission medium that inter-connects NASA Headquarters, installations, and major contractor locations for the transfer of data, voice, and video.

CENTER MANAGEMENT AND OPERATIONS - Provide administrative and financial services in support of Center management and provides for the operation and maintenance of the institutional facilities, systems, and equipment. Lead center for the development and implementation of the NASA Automation Consolidation Center (NACC)

ZERO-BASED REVIEW (ZBR) ACTIONS/HIGHLIGHTS - MSFC's ZBR recommended realignments are as follows: MSFC will establish an institute for science which will include the studies and research of hydrology. The Center will pursue plans to utilize the technology testbed for propulsion technology and other research and development activity during the FY 1996 timeframe. MSFC will also provide technical excellence in large optical systems and mirrors. As the Center of Excellence, MSFC is responsible for maintaining world class excellence in space propulsion. Their missions are Transportation Systems Development and Microgravity.

DISTRIBUTION OF FULL-TIME EQUIVALENT (FTE) WORKYEARS BY PROGRAM
MARSHALL SPACE FLIGHT CENTER

	FY 1995	FY 1996	FY 1997
Space station	327	376	320
U.S./Russian cooperative program	0	0	0
Space shuttle	676	629	524
Payload and utilization operations	196	125	195
Space science	432	434	400
Life and microgravity sciences	500	455	425
Mission to planet Earth	141	117	137
Aeronautical research and technology	0	0	0
Space access and technology	466	527	546
Mission communication services	0	0	0
Academic programs	9	9	9
Safety, reliability and quality assurance	4	4	4
Space communication services	14	14	14
Construction of facilities	0	0	0
Subtotal, direct workyears	**2,765**	**2,690**	**2,574**
Center management and operations	449	406	411
Program management (Headquarters)	0	0	0
Subtotal, full-time permanent (FTE's)	**3,214**	**3,096**	**2,985**
Other controlled FTEs	65	61	61
Total, full-time equivalents	**3,279**	**3,157**	**3,046**

JOHN C. STENNIS SPACE CENTER

ROLES AND MISSIONS

SPACE SHUTTLE - SSC will provide, operate, maintain, and manage a propulsion test center and related capabilities for development, certification, and acceptance of rocket propulsion systems and components. The Center will provide, maintain, and manage the facilities and the related capabilities required for the continued development and acceptance testing of the Space Shuttle Main Engines.

PAYLOAD AND UTILIZATION OPERATIONS - SSC will support the center's technical core laboratory operations. This support the center's capability to conduct advanced propulsion test technology research and development for government and commercial propulsion programs.

MISSION TO PLANET EARTH - SSC will conduct technology utilization, applications, and commercialization programs to support the Agency goals in environmental systems sciences and observations, remote sensing, and image processing systems and applicable products.

SPACE ACCESS AND TECHNOLOGY - The Center will conduct fundamental and applied research, develop advanced airborne sensors and data/information systems, conducts test and evaluation activities of remote sensing technology and image processing systems. It will also perform research applications for non-remote sensing, primarily in such areas as environmental system development and closed ecosystems development. The Center will participate in commercial program activities emphasizing promotion and development private sector investment in space-based technologies and promotion of industrial productivity through the transfer of technologies that derive from NASA's research and development programs and activities.

CENTER MANAGEMENT AND OPERATIONS - The Center will provide, operate, maintain, and manage the institutional base and laboratories required to accomplish and support assigned programs of NASA and other Federal and State agencies and organizations resident at the SSC.

ZERO-BASED REVIEW (ZBR) ACTIONS/HIGHLIGHTS - SSC s ZBR recommended realignments are as follows: SSC will manage all future rocket propulsion testing in cooperation with the National Propulsion Testing Alliance Initiatives. SSC's Mission and Center of Excellence is Propulsion Test Systems.

DISTRIBUTION OF FULL-TIME EQUIVALENT (FTE) WORKYEARS BY PROGRAM
STENNIS SPACE CENTER

	FY 1995	FY 1996	FY 1997
Space station	0	0	0
U.S./Russian cooperative program	0	0	0
Space shuttle	40	39	39
Payload and utilization operations	39	42	43
Space science	0	0	0
Life and microgravity sciences	0	0	0
Mission to planet Earth	2	1	1
Aeronautical research and technology	8	4	0
Space access and technology	26	33	38
Mission communication services	0	0	0
Academic programs	2	2	2
Safety, reliability and quality assurance	1	1	1
Space communication services	0	0	0
Construction of facilities	3	3	3
Subtotal, direct workyears	**121**	**125**	**127**
Center management and operations	86	79	77
Program management (Headquarters)	0	0	0
Subtotal, full-time permanent (FTE's)	**207**	**204**	**204**
Other controlled FTEs	12	15	15
Total, full-time equivalents	**219**	**219**	**219**

OFFICE OF SPACE FLIGHT
FY 1997 BUDGET TO OMB
SUPPORT SERVICE CONTRACT WORKFORCE FY 1995-2001
CENTER SUMMARY BY PROGRAM

SUMMARY	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001
TOTAL ALL PROGRAMS	28096	25874	23746	22241	20901	20251	19527
HUMAN SPACE FLIGHT	22576	20683	19211	18315	17409	16814	16259
SPACE STATION	3616	3327	3335	3256	3062	2693	2338
RUSSIAN COOPERATION	320	110	63	0	0	0	0
SPACE SHUTTLE	16060	14833	13602	13115	12728	12529	12354
PAYLOAD & UTILIZATION OPNS (EXCL ETB)	1078	892	871	628	381	374	360
ENGINEERING & TECHNICAL BASE	1502	1521	1340	1316	1238	1218	1207
SCIENCE, AERONAUTICS & TECHNOLOGY	1983	2026	1828	1446	1115	1105	960
SPACE SCIENCE	224	223	209	240	176	149	45
LIFE & MICROGRAVITY SCIENCE & APPLIC.	1417	1408	1259	854	601	635	628
MISSION TO PLANET EARTH	22	26	27	24	24	24	24
AERONAUTICAL RESEARCH & TECHNOLOGY	0	0	0	0	0	0	0
SPACE ACCESS AND TECHNOLOGY	292	341	305	300	286	269	235
MISSION COMMUNICATION SERVICES	25	25	25	25	25	25	25
ACADEMIC PROGRAMS	3	3	3	3	3	3	3
FUTURE PLANNING	0	0	0	0	0	0	0
MISSION SUPPORT	3537	3165	2707	2480	2377	2332	2308
SAFETY, RELIABILITY & QUALITY ASSURANCE	46	38	38	34	32	32	32
SPACE COMMUNICATION SERVICES	280	280	250	50	50	50	50
RESEARCH & PROGRAM MGMT (FS-41/42)	0	0	0	0	0	0	0
RESEARCH OPERATIONS & SUPPORT	3022	2764	2368	2310	2284	2239	2215
CONSTRUCTION OF FACILITIES	189	83	51	86	11	11	11

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OFFICE OF SPACE FLIGHT
FY 1997 BUDGET TO OMB
SUPPORT SERVICE CONTRACT WORKFORCE FY 1995-2001
BY PROGRAM

JOHNSON SPACE CENTER	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001
TOTAL ALL PROGRAMS	13013	11822	10439	9715	9026	8719	8258
HUMAN SPACE FLIGHT	10884	9846	8836	8391	7904	7569	7115
SPACE STATION	2651	2428	2365	2210	1991	1785	1523
RUSSIAN COOPERATIONS	261	82	29	0	0	0	0
SPACE SHUTTLE	7221	6544	5310	5628	5430	5304	5122
PAYLOAD & UTILIZATION OPERATIONS	89	75	86	39	16	16	15
ENGINEERING & TECH BASE	662	717	546	514	467	464	455
SCIENCE, AERONAUTICS & TECHNOLOGY	1014	972	846	608	419	482	481
SPACE SCIENCE	51	35	36	35	26	26	25
LIFE & MICROGRAVITY SCIENCE & APPLIC.	937	892	770	533	353	416	416
MISSION TO PLANET EARTH	0	0	0	0	0	0	0
AERONAUTICAL RESEARCH & TECHNOLOGY	0	0	0	0	0	0	0
SPACE ACCESS AND TECHNOLOGY	26	45	40	40	40	40	40
MISSION COMMUNICATION SERVICES	0	0	0	0	0	0	0
ACADEMIC PROGRAMS	0	0	0	0	0	0	0
FUTURE PLANNING	0	0	0	0	0	0	0
MISSION SUPPORT	1115	1004	757	716	703	668	662
SAFETY, RELIABILITY & QUALITY ASSURANCE	40	35	35	31	29	29	29
SPACE COMMUNICATION SERVICES	0	0	0	0	0	0	0
RESEARCH & PROGRAM MGMT (FS-41/42)	0	0	0	0	0	0	0
RESEARCH OPERATION SUPPORT	1075	969	722	685	674	639	633
CONSTRUCTION OF FACILITIES	0	0	0	0	0	0	0

OFFICE OF SPACE FLIGHT
FY 1997 BUDGET TO OMB
SUPPORT SERVICE CONTRACT WORKFORCE FY 1995-2001
BY PROGRAM

INT'L SPACE STATION ALPHA	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001
TOTAL ALL PROGRAMS	120	124	126	125	90	78	13
HUMAN SPACE FLIGHT	120	124	126	125	90	78	13
SPACE STATION	120	124	126	125	90	78	13
RUSSIAN COOPERATION							
SPACE SHUTTLE							
PAYLOAD & UTILIZATION OPERATIONS							
ENGINEERING AND TECHNICAL BASE							
SCIENCE, AERONAUTICS & TECHNOLOGY							
SPACE SCIENCE							
LIFE & MICROGRAVITY SCIENCE & APPLIC.							
MISSION TO PLANET EARTH							
AERONAUTICAL RESEARCH & TECHNOLOGY							
SPACE ACCESS AND TECHNOLOGY							
MISSION COMMUNICATION SERVICES							
ACADEMIC PROGRAMS							
FUTURE PLANNING							
MISSION SUPPORT							
SAFETY, RELIABILITY & QUALITY ASSURANCE							
SPACE COMMUNICATION SERVICES							
RESEARCH & PROGRAM MANAGEMENT							
RESEARCH & PROGRAM MGMT (FS-41/42)							
RESEARCH OPERATION SUPPORT							

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OFFICE OF SPACE FLIGHT
FY 1997 BUDGET TO OMB
SUPPORT SERVICE CONTRACT WORKFORCE FY 1995-2001
BY PROGRAM

KENNEDY SPACE CENTER	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001
TOTAL ALL PROGRAMS	10657	9955	9596	9262	8892	8713	8676
HUMAN SPACE FLIGHT	9464	8788	8566	8306	7997	7815	7773
SPACE STATION	645	579	658	738	798	672	646
RUSSIAN COOPERATIONS	59	28	34				
SPACE SHUTTLE	7784	7350	7071	6889	6727	6678	6675
PAYLAOD & UTILIZATION OPERATIONS	834	707	696	572	365	358	345
ENGINEERING & TECH BASE	142	124	107	107	107	107	107
SCIENCE, AERONAUTICS & TECHNOLOGY	238	218	200	126	65	68	73
SPACE SCIENCE							
LIFE & MICROGRAVITY SCIENCE & APPLIC.	192	169	151	76	14	16	21
MISSION TO PLANET EARTH							
AERONAUTICAL RESEARCH & TECHNOLOGY							
SPACE ACCESS AND TECHNOLOGY	46	49	49	50	51	52	52
MISSION COMMUNICATION SERVICES							
ACADEMIC PROGRAMS							
FUTURE PLANNING							
MISSION SUPPORT	955	949	830	830	830	830	830
SAFETY, RELIABILITY & QUALITY ASSURANCE							
SPACE COMMUNICATION SERVICES							
RESEARCH & PROGRAM MGMT (FS-41/42)							
RESEARCH OPERATION SUPPORT	955	949	830	830	830	830	830
CONSTRUCTION OF FACILITIES							

OFFICE OF SPACE FLIGHT
FY 1997 BUDGET TO OMB
SUPPORT SERVICE CONTRACT WORKFORCE FY 1995-2001
BY PROGRAM

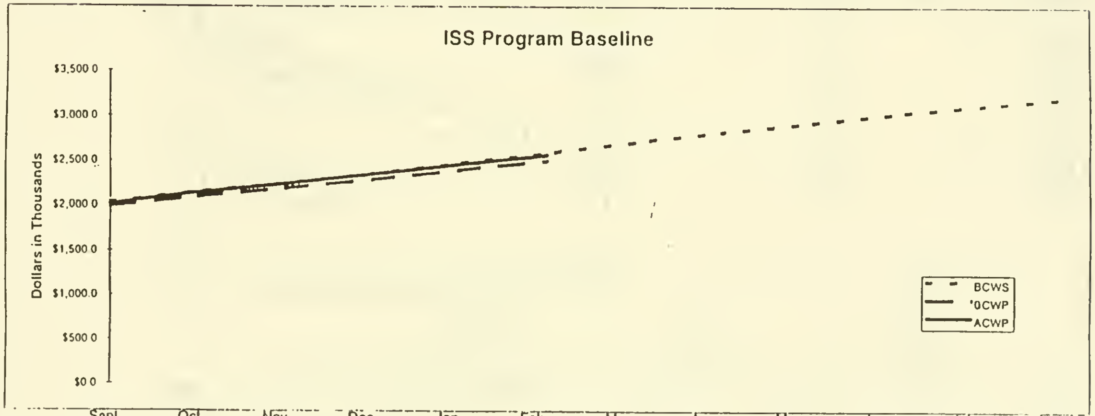
MARSHALL SPACE FLIGHT CENTER	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001
TOTAL ALL PROGRAMS	3214	3023	2739	2376	2220	2068	1907
HUMAN SPACE FLIGHT	1527	1369	1184	1101	1041	975	981
SPACE STATION	200	196	186	183	183	158	156
RUSSIAN COOPERATIONS	0	0	0	0	0	0	0
SPACE SHUTTLE	494	403	242	226	214	190	200
PAYLOAD & UTILIZATION OPERATIONS	155	110	89	17	0	0	0
ENGINEERING & TECH BASE	678	660	667	675	644	627	625
SCIENCE, AERONAUTICS & TECHNOLOGY	631	736	682	612	531	455	306
SPACE SCIENCE	173	188	173	205	150	123	20
LIFE & MICROGRAVITY SCIENCE & APPLIC.	288	347	338	245	234	203	191
MISSION TO PLANET EARTH	21	25	26	23	23	23	23
AERONAUTICAL RESEARCH & TECHNOLOGY	0	0	0	0	0	0	0
SPACE ACCESS AND TECHNOLOGY	121	148	117	111	96	78	44
MISSION COMMUNICATION SERVICES	25	25	25	25	25	25	25
ACADEMIC PROGRAMS	3	3	3	3	3	3	3
FUTURE PLANNING	0	0	0	0	0	0	0
MISSION SUPPORT	1056	918	873	663	648	638	620
SAFETY, RELIABILITY & QUALITY ASSURANCE	5	2	2	2	2	2	2
SPACE COMMUNICATION SERVICES	280	280	250	50	50	50	50
RESEARCH & PROGRAM MGMT (FS-41/42)	0	0	0	0	0	0	0
RESEARCH OPERATION SUPPORT	758	623	610	600	585	575	557
CONSTRUCTION OF FACILITIES	13	13	11	11	11	11	11

OFFICE OF SPACE FLIGHT
FY 1997 BUDGET TO OMB
SUPPORT SERVICE CONTRACT WORKFORCE FY 1995-2001
BY PROGRAM

STENNIS SPACE CENTER	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001
TOTAL ALL PROGRAMS	1092	950	846	763	673	673	673
HUMAN SPACE FLIGHT	581	556	499	392	377	377	377
SPACE STATION							
RUSSIAN COOPERATION							
SPACE SHUTTLE	561	536	479	372	357	357	357
PAYLOAD & UTILIZATION OPERATIONS							
ENGINEERING & TECH BASE	20	20	20	20	20	20	20
SCIENCE, AERONAUTICS & TECHNOLOGY	100	100	100	100	100	100	100
SPACE SCIENCE							
LIFE & MICROGRAVITY SCIENCE & APPLIC.							
MISSION TO PLANET EARTH	1	1	1	1	1	1	1
AERONAUTICAL RESEARCH & TECHNOLOGY							
SPACE ACCESS AND TECHNOLOGY	99	99	99	99	99	99	99
MISSION COMMUNICATION SERVICES							
ACADEMIC PROGRAMS							
FUTURE PLANNING							
MISSION SUPPORT	411	294	247	271	196	196	196
SAFETY, RELIABILITY & QUALITY ASSURANCE	1	1	1	1	1	1	1
SPACE COMMUNICATION SERVICES							
RESEARCH & PROGRAM MGMT (FS-41/42)							
RESEARCH OPERATION SUPPORT	234	223	206	195	195	195	195
CONSTRUCTION OF FACILITIES	176	70	40	75			

INTERNATIONAL SPACE STATION

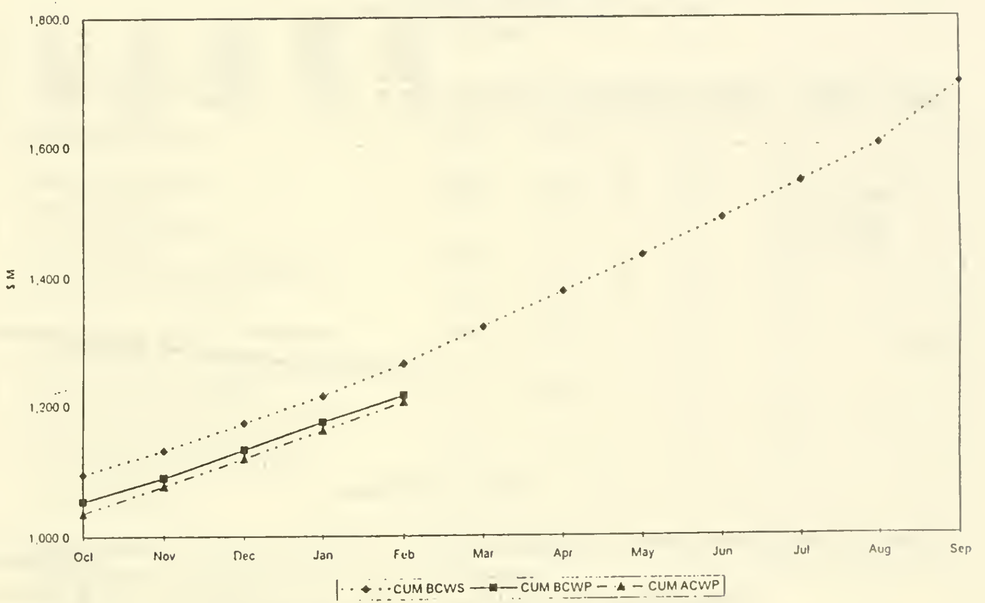
International Space Station
Cost & Schedule Performance
Prime



	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr.	May	Jun	Jul	Aug
BCWS	$2,033.0	$2,150.3	$2,247.0	$2,357.6	$2,476.6	$2,585.8	$2,710.6	$2,819.2	$2,921.7	$3,031.3	$3,126.6	$3,214 4
BCWP	$1,987.7	$2,095.0	$2,191.4	$2,294.3	$2,399.8	$2,501.2						
ACWP	$2,017.2	$2,142.5	$2,243.3	$2,352.5	$2,462.2	$2,565.1						
CV	($29.5)	($47.5)	($51.9)	($58.2)	($62.4)	($63.9)						
SV	($46.1)	($55.3)	($55.6)	($63 3)	($76.8)	($84.6)						

FY 96

SPACE STATION PERFORMANCE MEASUREMENT
NON-PRIME



	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
CUM BCWS	1,094.0	1,130.0	1,172.0	1,214.0	1,263.4	1,319.9	1,376.4	1,432.9	1,489.4	1,545.9	1,602.4	1,696.7
CUM BCWP	1,053.0	1,089.0	1,131.0	1,173.0	1,214.2							
CUM ACWP	1,035.0	1,076.0	1,118.0	1,160.0	1,203.9							
CV	18.0	13.0	13.0	13.0	10.3							
SV	(41.0)	(41.0)	(41.0)	(41.0)	(49.2)							

FY 96

Performance Measurement

($ in Millions)

	Pre-Novation	Feb 94 thru Feb-96	Cumulative to Date
BCWS	$ 525	$ 3,849	$ 4,374
Prime*	380	2,586	2,966
Non-Prime	145	1,263	1,408
BCWP	$ 525	$ 3,715	$ 4,240
Prime*	380	2,501	2,881
Non-Prime	145	1,214	1,359
ACWP	$ 525	$ 3,769	$ 4,294
Prime*	380	2,565	2,945
Non-Prime	145	1,204	1,349

Schedule Variance (BCWP - BCWS)		SPI
Prime	(85)	97.1%
Non-Prime	(49)	96.5%
Total	(134)	96.9%

Cost Variance (BCWP - ACWP)		CPI
Prime	(64)	97.8%
Non-Prime	10	100.8%
Total	(54)	98.8%

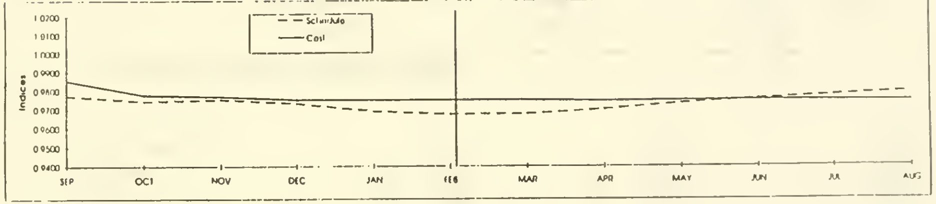
* Excludes Prime Fee

INTERNATIONAL
SPACE STATION

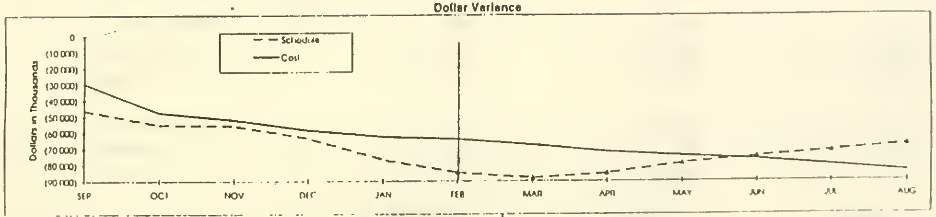
International Space Station
Cost & Schedule Performance Summary
Prime

	CUM-TO-DATE	VARIANCE		AT COMPLETION		PERFORMANCE INDEX			
		Schedule	Cost						
BCWS	7,585,777			Budget	5,806,541			% Complete	42 3%
BCWP	7,501,155			EAC	5,816,541	CPI	0 978	% Spent	43 4%
ACWP	2,565,083	(84,618)	(63,974)	Variance	-10,000	SPI	0 987	TCPI	1 016

Cost & Schedule Trend



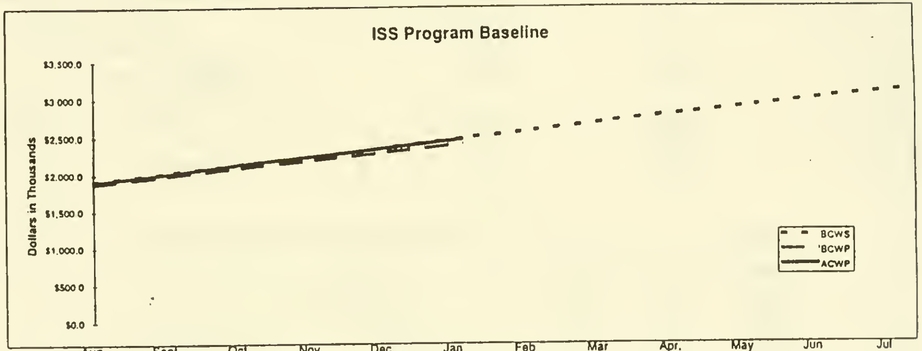
Dollar Variance



	Cum-to-Date Actual						Six Month Forecast					
	Sep 95	Oct 95	Nov 95	Dec 95	Jan 96	Feb 96	Mar 96	Apr 96	May 96	Jun 96	Jul 96	Aug 96
CTD SPI	0 977	0.974	0 975	0 973	0.969	0 967	0.966	0.970	0.973	0.978	0.977	0 970
CTD CPI	0.985	0.976	0.977	0 975	0 975	0 975	0.975	0.975	0.975	0.975	0.975	0.974
CTD SV	(46,101)	(55,285)	(55,546)	(63,264)	(76,614)	(84,616)	(86,121)	(86,101)	(78,873)	(74,688)	(71,420)	(67,175)
CTD CV	(29,916)	(47,507)	(51,683)	(58,769)	(62,433)	(63,624)	(67,447)	(71,706)	(74,099)	(76,405)	(80,080)	(83,760)
TCPI	1.006	1.012	1.015	1.017	1.019	1.016	1.021	1.022	1.026	1.027	1.029	1.032

FY 96

International Space Station
Cost & Schedule Performance
Prime


ISS Program Baseline

	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr.	May	Jun	Jul
BCWS	$1,911.7	$2,033.8	$2,150.3	$2,247.0	$2,357.6	$2,476.6	$2,581.6	$2,698.1	$2,803.7	$2,903.0	$3,012.0	$3,106.7
BCWP	$1,888.9	$1,987.7	$2,095.0	$2,191.4	$2,294.3	$2,399.8						
ACWP	$1,697.5	$2,017.2	$2,142.5	$2,243.3	$2,352.5	$2,462.2						
CV	($28.6)	($29.5)	($47.5)	($51.9)	($58.2)	($62.4)						
SV	($42.8)	($46.1)	($55.3)	($55.6)	($63.3)	($76.8)						

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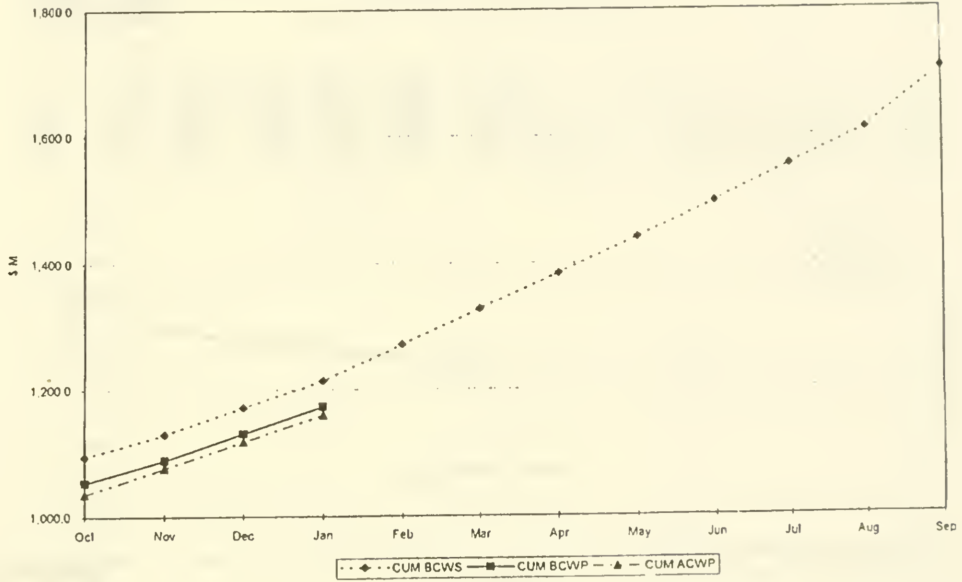
FY 96

SPACE STATION PERFORMANCE MEASUREMENT
NON-PRIME



	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
CUM BCWS	1,094.0	1,130.0	1,172.0	1,214.0	1,270.5	1,327.0	1,383.5	1,440.0	1,496.5	1,553.0	1,609.5	1,703.8
CUM BCWP	1,053.0	1,089.0	1,131.0	1,173.0								
CUM ACWP	1,035.0	1,076.0	1,118.0	1,160.0								
CV	18.0	13.0	13.0	13.0								
SV	(41.0)	(41.0)	(41.0)	(41.0)								

FY 96

Performance Measurement

($ in Millions)

	Pre-Novation	Feb 94 thru Jan-96	Cumulative to Date
BCWS	$ 525	$ 3,690	$ 4,215
Prime*	380	2,477	2,857
Non-Prime	145	1,214	1,359
BCWP	$ 525	$ 3,573	$ 4,098
Prime*	380	2,400	2,780
Non-Prime	145	1,173	1,318
ACWP	$ 525	$ 3,622	$ 4,147
Prime*	380	2,462	2,842
Non-Prime	145	1,160	1,305

Schedule Variance (BCWP - BCWS)		SPI
Prime	(77)	97%
Non-Prime	(41)	97%
Total	(118)	97%

Cost Variance (BCWP - ACWP)		CPI
Prime	(62)	98%
Non-Prime	13	101%
Total	(49)	99%

* Excludes Prime Fee

INTERNATIONAL
SPACE STATION

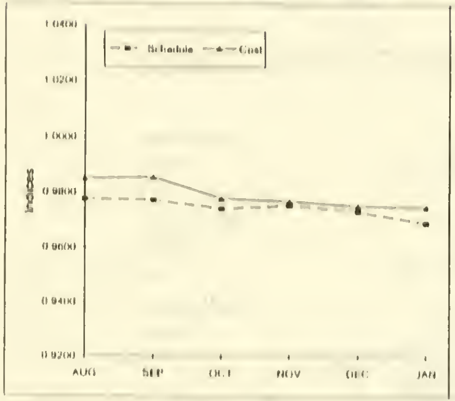
International Space Station
Cost & Schedule Performance Summary

	CUM-TO-DATE		
		VARIANCE	
BCWS	2,476,601	Schedule	Cost
BCWP	2,399,787	(76,814)	(62,433)
ACWP	2,462,220		

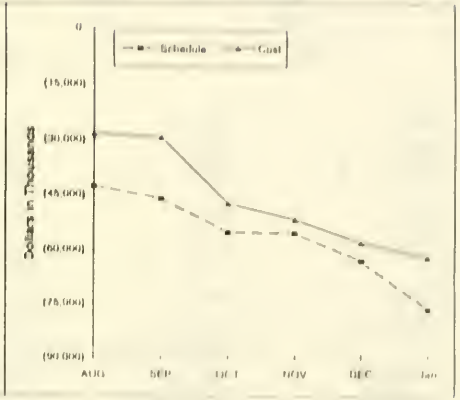
AT COMPLETION	
Budget	5,870,947
EAC	5,870,947
Variance	0

PERFORMANCE INDEX	
CPI	0.975
SPI	0.969

% Complete	40.9%
% Spent	41.9%
TCPI	1.018

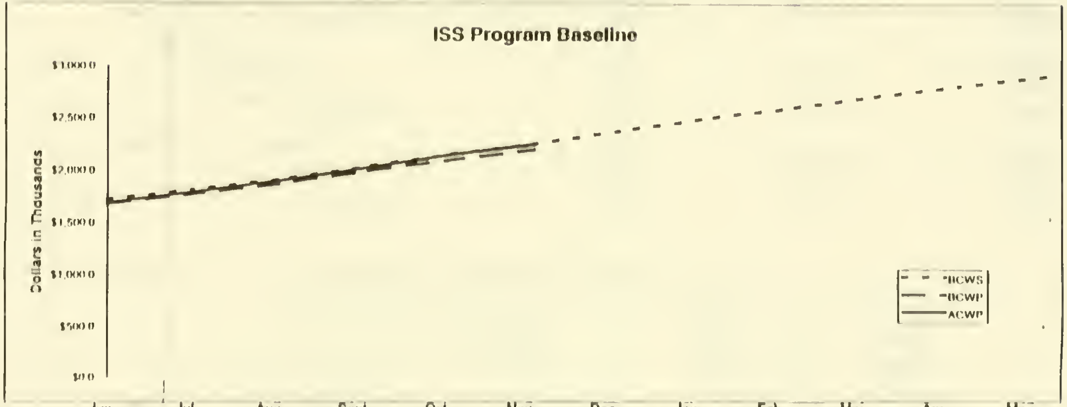


Cost & Schedule Trend



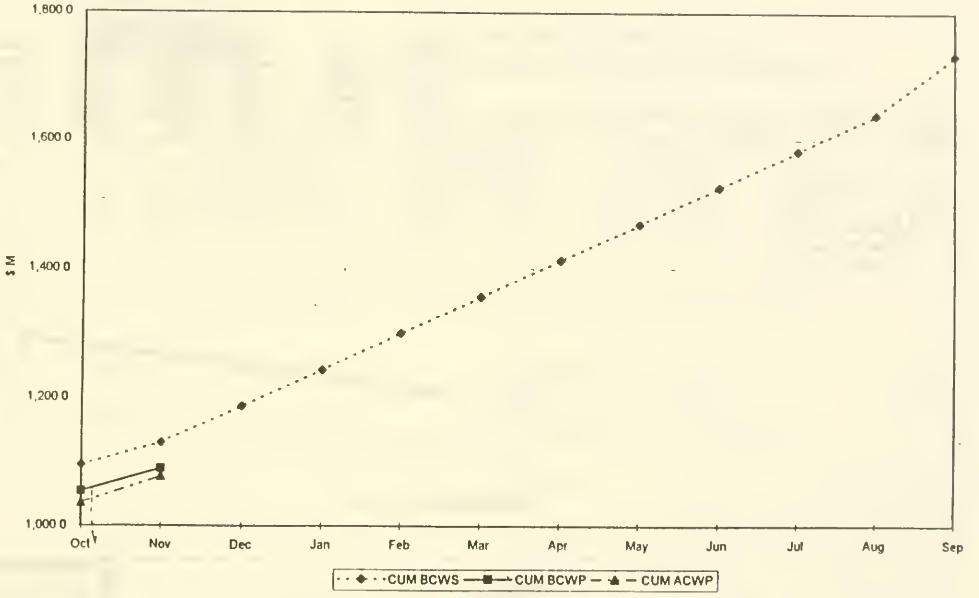
Dollar Variance

International Space Station
Cost & Schedule Performance
Prime



	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
BCWS	$1,723.8	$1,814.3	$1,911.7	$2,033.8	$2,150.3	$2,247.0	$2,371.3	$2,490.3	$2,591.8	$2,703.8	$2,805.7	$2,904.6
BCWP	$1,673.7	$1,768.8	$1,868.9	$1,987.7	$2,095.0	$2,191.4						
ACWP	$1,688.8	$1,788.1	$1,897.5	$2,017.2	$2,142.5	$2,243.3						
CV	($15.1)	($19.3)	($28.6)	($29.5)	($47.5)	($51.9)						
SV	($50.1)	($45.5)	($42.8)	($46.1)	($55.3)	($55.6)						

SPACE STATION PERFORMANCE MEASUREMENT
NON-PRIME



	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
CUM BCWS	1,094.0	1,130.0	1,186.5	1,243.0	1,299.5	1,356.0	1,412.5	1,469.0	1,525.5	1,582.0	1,638.5	1,732 8
CUM BCWP	1,053.0	1,089.0										
CUM ACWP	1,035.0	1,076.0										
CV	18 0	13.0										
SV	(41.0)	(41.0)										

FY 96

Space Station Performance Measurement

($ In Millions)

Total Program Earned Value Performance

	Pre-Novation	Feb 94 thru Nov-95	Cumulative to Date
BCWS	$ 525	$ 3,377	$ 3,902
Prime*	380	2,247	2,627
Non-Prime	145	1,130	1,275
BCWP	$ 525	$ 3,280	$ 3,805
Prime*	380	2,191	2,571
Non-Prime	145	1,089	1,234
ACWP	$ 525	$ 3,319	$ 3,844
Prime*	380	2,243	2,623
Non-Prime	145	1,076	1,221

Schedule Variance (BCWP - BCWS)		
Prime	(56)	97.9%
Non-Prime	(41)	96.8%
Total	(96)	97.5%

Cost Variance (BCWP - ACWP)		
Prime	(52)	98.0%
Non-Prime	13	101.0%
Total	(39)	99.0%

* Excludes Prime Fee

FY 96

INTERNATIONAL
SPACE STATION

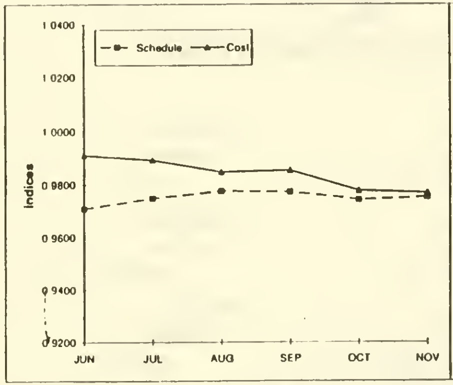
International Space Station
Cost & Schedule Performance Summary

	CUM-TO-DATE		
BCWS	2,246,978	VARIANCE	
BCWP	2,191,429	Schedule	Cost
ACWP	2,243,312	(55,549)	(51,883)

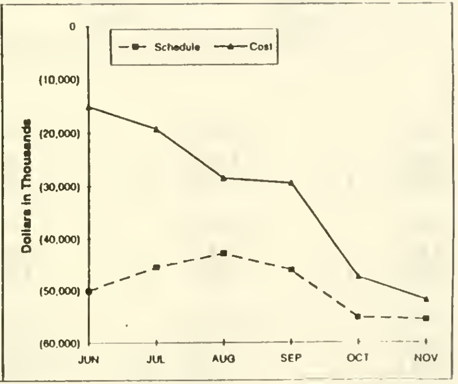
AT COMPLETION	
Budget	5,784,504
EAC	5,784,504
Variance	0

PERFORMANCE INDEX	
CPI	0.977
SPI	0.975

PERCENT COMPLETE
37.88%



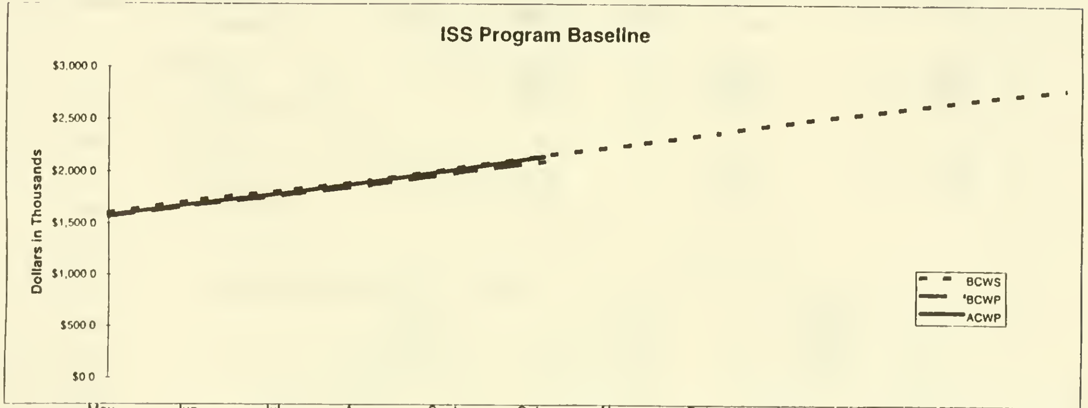
Cost & Schedule Trend



Dollar Variance

INTERNATIONAL
SPACE STATION
ALPHA

International Space Station
Cost & Schedule Performance
Prime

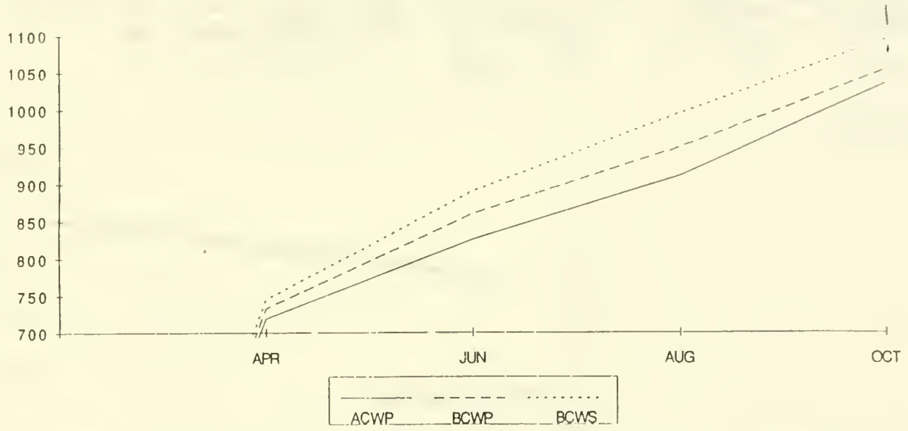


	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr.
BCWS	$1,602.4	$1,723.8	$1,814.3	$1,911.7	$2,033.8	$2,150.3	$2,259.7	$2,375.3	$2,494.4	$2,594.1	$2,701.6	$2,798.8
BCWP	$1,561.2	$1,673.7	$1,768.8	$1,868.9	$1,987.7	$2,095.0						
ACWP	$1,576.9	$1,688.8	$1,788.1	$1,897.5	$2,017.2	$2,142.5						
CV	($15.7)	($15.1)	($19.3)	($28.6)	($29.5)	($47.5)						
SV	($41.2)	($50.1)	($45.5)	($42.8)	($46.1)	($55.3)						

FY 96

REPRODUCED AT GOVT EXPENSE

SPACE STATION PERFORMANCE MEASUREMENT
NON-PRIME (AFTER NOVATION)



	Apr-95	Jun-95	Aug-95	Oct-95
CUM ACWP	719.0	826.4	911.4	1035.1
CUM BCWP	733.0	860.5	949.6	1053.2
CUM BCWS	745.0	891.2	995.2	1094.0
CV	*14.0*	*34.1*	*38.2*	*18.1*
SV	*-12.0*	*-30.7*	*-45.6*	*-40.8*

REPRODUCED AT GOVT EXPENSE

Space Station Performance Measurement

($ in Millions)

Total Program Earned Value Performance

	Pre-Novation	Feb 94 thru Oct-95	Cumulative to Date
BCWS	$ 525	$ 3,244	$ 3,769
Prime*	380	2,150	2,530
Non-Prime	145	1,094	1,239
BCWP	$ 525	$ 3,148	$ 3,673
Prime*	380	2,095	2,475
Non-Prime	145	1,053	1,198
ACWP	$ 525	$ 3,177	$ 3,702
Prime*	380	2,142	2,522
Non-Prime	145	1,035	1,180

Schedule Variance (BCWP - BCWS)

Prime	(55)	97.8%
Non-Prime	(41)	96.7%
Total	(96)	97.5%

Cost Variance (BCWP - ACWP)

Prime	(47)	98.1%
Non-Prime	18	101.5%
Total	(29)	99.2%

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* Excludes Prime Fee

INTERNATIONAL
SPACE
STATION

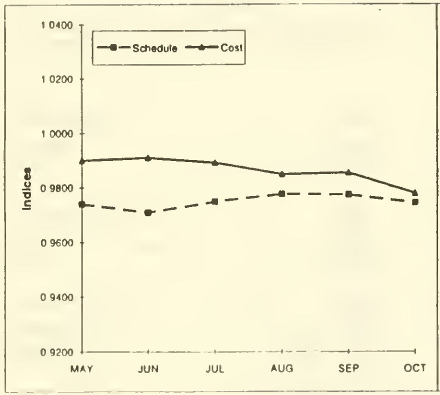
International Space Station
Cost & Schedule Performance Summary

	CUM-TO-DATE		
		VARIANCE	
BCWS	2,150,252		
BCWP	2,094,987	Schedule	Cost
ACWP	2,142,494	(55,265)	(47,507)

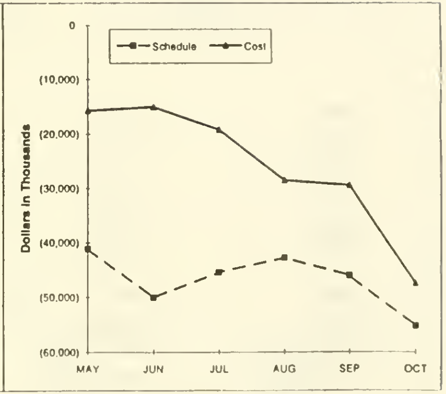
AT COMPLETION	
Budget	5,776,064
EAC	5,776,064
Variance	0

PERFORMANCE INDEX	
CPI	0.978
SPI	0.974

PERCENT COMPLETE
36.27%



Cost & Schedule Trend

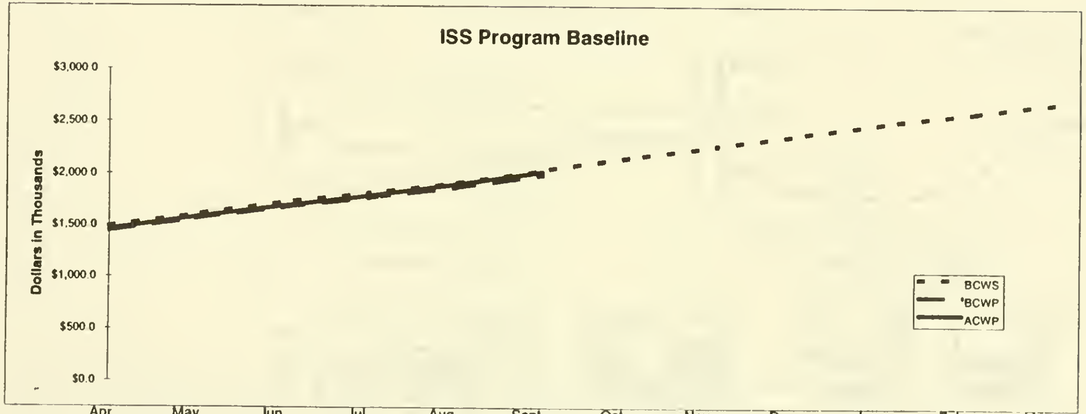


Dollar Variance

REPRODUCED AT GOVT. EXPENSE

INTERNATIONAL
SPACE STATION
ALPHA

International Space Station
Cost & Schedule Performance
Prime



	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
BCWS	$1,483.7	$1,602.4	$1,723.8	$1,814.3	$1,911.7	$2,033.8	$2,159.2	$2,268.7	$2,382.7	$2,498.3	$2,595.4	$2,701.6
BCWP	$1,438.7	$1,561.2	$1,673.7	$1,768.8	$1,868.9	$1,987.7						
ACWP	$1,455.1	$1,576.9	$1,688.8	$1,788.1	$1,897.5	$2,017.2						
CV	($16.4)	($15.7)	($15.1)	($19.3)	($28.6)	($29.5)						
SV	($45.0)	($41.2)	($50.1)	($45.5)	($42.8)	($46.1)						

INTERNATIONAL
SPACE
STATION

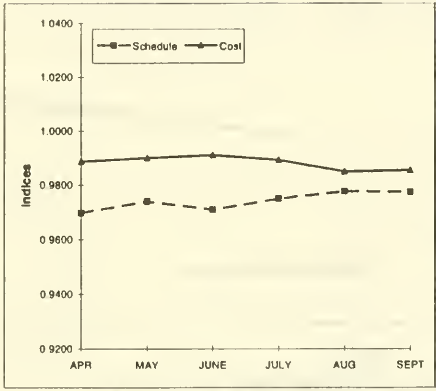
International Space Station
Cost & Schedule Performance Summary

	CUM-TO-DATE		
BCWS	2,033,793	VARIANCE	
BCWP	1,987,692	Schedule	Cost
ACWP	2,017,207	(46,101)	(29,515)

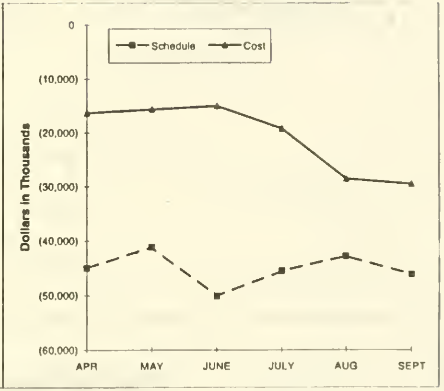
AT COMPLETION	
Budget	5,750,138
EAC	5,750,138
Variance	0

PERFORMANCE INDEX	
CPI	0.99
SPI	0.98

PERCENT COMPLETE
34.57%



Cost & Schedule Trend



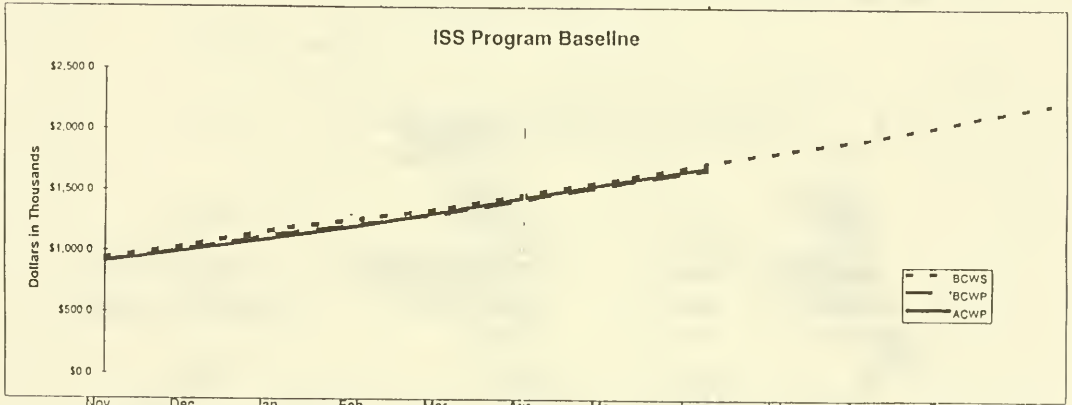
Dollar Variance

REPRODUCED AT GOVT EXPENSE

INTERNATIONAL
SPACE STATION
ALPHA

International Space Station
Cost & Schedule Performance

Prime



	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
BCWS	$939.7	$1,044.8	$1,175.8	$1,263.4	$1,357.2	$1,483.7	$1,602.4	$1,723.8	$1,838.1	$1,943.1	$2,082.7	$2,217 3
BCWP	$914.3	$1,017.4	$1,132.4	$1,219.8	$1,313.3	$1,438.7	$1,561.2	$1,673.7				
ACWP	$908.1	$1,004.6	$1,105.9	$1,208.7	$1,329.5	$1,455.1	$1,578.9	$1,688.8				
CV	$8.2	$12.8	$28.5	$10.9	($18.2)	($10.4)	($15.7)	($15.1)				
SV	($25.4)	($27.4)	($43.2)	($43.8)	($43.9)	($45.0)	($41.2)	($50.1)				

FY 95

REPRODUCED AT GOVT EXPENSE

Space Station Performance Measurement

($ In Millions)

February, 1994 through June, 1995

COST PERFORMANCE	CUM BCWP	CUM ACWP	COST VARIANCE
Total Space Station	2534.2	2515.2	19.0
Prime *	1673.7	1688.8	(15.1)
Non-Prime	860.5	826.4	34.1

SCHEDULE PERFORMANCE	CUM BCWP	CUM BCWS	SCHEDULE VARIANCE
Total Space Station	2534.2	2615.0	(80.8)
Prime *	1673.7	1723.8	(50.1)
Non-Prime	860.5	891.2	(30.7)

REPRODUCED AT GOVT EXPENSE

INTERNATIONAL
SPACE
STATION

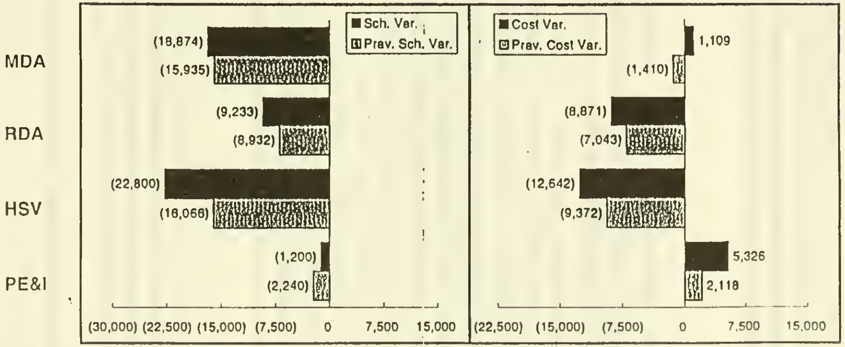
International Space Station
Cost & Schedule Performance Summary

(Data as of June Month-End)

SCHEDULE VARIANCE

COST VARIANCE

PRODUCT GROUP TOTALS



	CUM-TO-DATE			SCHEDULE	COST	AT-COMPLETION		
	BUDGET	BCWP	ACWP	VARIANCE	VARIANCE	BUDGET	EAC	VARIANCE
TOTAL$	$1,723,828	$1,673,719	$1,688,797	($50,107)	($15,078)	$5,957,133	$5,957,133	$0

FY 95

Responses to written questions submitted by Cong. Stockman resulting from the March 28, 1996, hearing.

QUESTION 1:

During the posture briefing you outlined that approximately a $100 million portion of the shuttle program management budget had been mistakenly kept in the headquarters account and that this money will instead go to the JSC budget. Please provide the updated figures for the JSC budget.

ANSWER 1:

The estimates for FY 1997 for the Johnson Space Center should be considered preliminary. During the budget formulation process, amounts are often retained in the Headquarters account where a clear decision has not been made on the performing installation. In the FY 1998 budget request, the FY 1997 estimate will reflect an updated distribution of funds from Headquarters to the Centers. Budgets are distributed by performing center not lead center, therefore budget allocations will not necessarily track to management responsibility. Future budget levels for JSC should remain constant or increase due to transfer of Space Operations responsibilities to JSC, and the rapidly increasing level of Space Station Operations activity.

QUESTION 2:

Are preliminary figures available for the new retirement options being offered by JSC? How many have enrolled to date? What are the expected savings?

ANSWER 2:

The Careers Plus Program at the JSC includes Trial Retirement, Phased Retirement, Partners in Education and Partners in Technology. To date JSC has had participants in the Trial and Phased plans only.

JSC has had 12 people enroll in the Trial Retirement Program.

Estimated Savings:

FY96	FY97	FY98	FY99	FY00	FY01
.5M	1.2M	1.2M	1.3M	1.3M	1.3M

We have had two people enroll in the Phased Retirement Program.

Estimated Savings:

FY96	FY97	FY98	FY99	FY00	FY01
.05M	.1M	.2M	.2M	.2M	.2M

JSC has experienced a slowdown in the rate of attrition, which is also being experienced throughout the Agency.

QUESTION 2a:

Is it envisioned that these expanded options will be sufficient to allow JSC to meet the targeted reductions without having to employ any RIF?

ANSWER 2a:

Probably not alone. JSC would need a buyout in order to achieve the FTE controls. Every little bit helps, though and certainly this program is a positive option, with essentially no cost.

QUESTION 3:

Is the biomedical Institute program on schedule? Is NASA receiving adequate initial participation form university and outside interests to successfully implement this concept?

ANSWER 3:

At this time, the implementation of the National Space Biomedical Research Institute is on schedule, and significant interest by universities and other external entities has been expressed.

NASA has begun the process through which up to three NASA Science Institutes could be established within the next two years. The formation of the first of these NASA Science Institutes, the National Space Biomedical Research Institute at the Johnson Space Center (JSC) in Texas, was initiated by the release of the draft Cooperative Agreement Notice (CAN) on May 1, 1996.

NASA held a structured workshop on May 13, 1996, at JSC, to provide substantive interaction between NASA and any potential offeror and to solicit comments on the draft CAN. Approximately 40 individuals attended the workshop. The results, comments and a list of attendees of the workshop will be available on the Internet address listed below. A list of attendees and the current draft CAN are attached.

The draft CAN is available worldwide through the Internet at the following URL: http://www.jsc.nasa.gov/bd2 under the following topic within the Business Opportunities menu: Posted: 04/19/96 -- Title: NATIONAL SPACE BIOMEDICAL RESEARCH INSTITUTE (NSBRI) SOL: 9-CAN-96-01."

QUESTION 4:

What is NASA's current view of the possibility of a consolidated space operations contract?

ANSWER 4:

NASA plans to release an RFP for the Consolidated Space Operations Contract (CSOC) this summer. An agency-wide team has developed a draft statement of work and RFP that will be available to the public by May 31, 1996. Based on progress made to date and contractor interest we've seen demonstrated over the

past few months, NASA rates the likelihood of writing such a consolidated contract as very
high.

QUESTION 4a:

What is the range of potential savings envisioned for such a consolidation?

ANSWER 4a:

The possible savings will become known only upon receipt of proposals for CSOC. NASA expects savings to result from reducing management overhead, eliminating duplication, and contractor response to savings incentives.

QUESTION 4b:

If viewed negatively, what other steps is NASA considering to pursue potential savings in the operations area?

ANSWER 4b:

NASA expects savings from CSOC, but there are other initiatives underway at all NASA field centers. These include consolidating existing contracts, converting contract types, infusing automation technology, and commercializing routine services. All of these initiatives will continue regardless of progress toward a CSOC award.

QUESTION 4c:

If viewed favorably, is there concern over the small number of bidders that would reasonably qualify to bid on such a large contract?

ANSWER 4c:

The services in the CSOC arena are primarily facility/software maintenance and operations & sustaining engineering of software and facilities, and telecommunications systems services, none of which are unique to the aerospace industry. In addition, NASA has made every effort to advertise the CSOC to anyone who might be interested. The result is that we hope for a significant number of offerors and expect to have viable competition.

QUESTION 4d:

Additionally, if viewed favorably, is there concern about the potential long term loss of competition for operations, or the potential for abuse from the prime toward the subcontractors?

ANSWER 4d:

Current plans for the CSOC will motivate the contractor to commercialize appropriate services to the lowest cost provider. This will allow for continued commercial opportunities throughout the contract period. Regarding subcontractor abuses, existing contractual provisions should adequately protect subcontractor rights or provide a satisfactory means of redress.

QUESTION 5:

What is the entire budget that goes toward the Ames animal facility?

ANSWER 5:

The Animal Care Facility at NASA's Ames Research Center receives an annual budget of approximately $900K. The funding covers the procurement of research animals on an as needed bases, animal care and maintenance support personnel and the upkeep of the facility.

QUESTION 5a:

What savings could be provided by closing the Ames animal facility, with any future testing, if needed, being performed by independent laboratories?

ANSWER 5a:

The Animal Care Facility is a housing and holding facility only. NASA does not breed animals for research.

NASA's Ames Research Center regularly assesses the cost effectiveness of its facilities including the Animal Care Facility (ACF). Past studies indicated that it would cost more to provide animals, animal care and maintenance under contract off-site than on-site. NASA is in the process of conducting an analysis to determine if these assessments are still correct and what greater efficiency can be achieved in the management of the current facility. Transporting animals to and from some other location would introduce additional stresses to the animals and confound research results.

The ACF at Ames not only serves NASA Ames scientists but mostly supports the many scientists from universities around the country who come to Ames to use its unique gravitational facilities. It also supports integrated ground testing of flight payloads for both the U.S. and international communities.

QUESTION 5b:

Are animal experiments the best use of extremely limited NASA dollars thirty years after humans entered space?

ANSWER 5b:

NASA does not maintain a separate program of animal research. NASA formulates its program of biomedical research based on meritorious, peer-reviewed proposals that address the central questions of gravity, biology, and space flight. Selection for flight is based upon rigorous peer review. NASA selects the most meritorious and valuable science proposed from around the world without regard to whether it uses plant or animal models, cultured cells, or human subjects. In

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space, as on the ground, these and other models are important to the future progress of biomedical research.

Animal experiments are as important today as they were thirty years ago when they were used to demonstrate the safety of short term space travel for humans before humans ever went into space. So far, we know that three humans have tolerated exposure to space flight conditions for periods up to one year and one individual for 16 months, but we also know that there are serious biomedical changes of doing so requiring lengthy rehabilitation. During space flight, our bodies adapt to the microgravity environment in ways that can have serious consequences when we return to a higher gravity field, e.g., Earth or Mars. For example, during space flight, bones and muscles lose mass and strength; the heart weakens; the immune system and healing processes are impaired; and movement control, coordination and balance are affected. To work in space safely and continue the exploration and development of space, human research complemented by animal research is essential to understand the risks to which we are exposing our space travelers and to develop ways to reduce those risks.

QUESTION 5c:

What hardships will be imposed on international treaties or obligations if Congress decides to de-fund the Bion projects?

ANSWER 5c:

Vice President Gore and Russian Prime Minister Chernomyrdin agreed to proceed with contracts to facilitate scientific cooperation. NASA has contracted with the Russian Space Agency to provide 50% of the scientific payload of a two-week unmanned biosatellite mission with rhesus monkeys (Bion 11) and has an option to repeat the mission two years later in order to enhance the statistical significance of the scientific studies (Bion 12). NASA's credibility with its international partners is predicated on doing what we say we will do. For over twenty years, NASA has engaged in an extremely successful joint biosatellite program with the Russians. Eight missions were flown involving more than one hundred US scientists and resulting in over 150 publications in peer reviewed journals. These research results have greatly advanced our understanding of the effects of space flight on biological systems. Following the cancellation of the SLS-3 mission for which NASA and the French space agency (CNES) were jointly developing a research facility to accommodate rhesus monkeys, NASA invited CNES to participate in the Bion 11 and 12 missions. Thus, the termination of the Bion Project would have contractual ramifications as well as impugn our credibility with not only the Russians but also with the French.

QUESTION 5d:

What medical knowledge of inescapable importance will be lost if no further animal tests are performed by NASA?

ANSWER 5d:

NASA does not maintain a separate program of animal research. NASA formulates its program of biomedical research based on meritorious, peer-reviewed proposals that address the central questions of gravity, biology, and space flight. Selection for flight is based upon rigorous peer review. NASA selects the most meritorious and valuable science proposed from around the world without regard to whether it uses plant or animal models, cultured cells, or human subjects. In space, as on the ground, these and other models are important to the future progress of biomedical research.

If NASA were to eliminate all proposals involving animals from consideration, then the agency would no longer be selecting proposals based on scientific merit. By following such a policy, NASA would not be doing everything in its power to reduce the risks of human space flight.

Medical research supported by NASA, like that in the NIH, requires complementary studies with animals, cells and tissues, and humans. Cells and tissues are used whenever possible; however, to fully understand what is going on in the body to the degree necessary to develop and test effective countermeasures, complementary studies including those using invasive procedures, require animal models. Further, astronauts are frequently unavailable as research subjects and their use as such is compromised by the countermeasures they normally utilize, e.g., exercise, motion sickness medication, etc. The identification of hazards and reduction of risk to humans continues to be the motivating factor for the animal research program.

QUESTION 6:

Is it correct as reported that the FY 1997 budget submitted uses CBO figures through the year 2000, then switches to OMB estimates? If so, why? Doesn't this kind of budget shell game gimmickry make the job more difficult for both government and the Aerospace industry to plan around, and harder for the American people to understand and trust that we are honestly balancing the budget as promised?

ANSWER 6:

The budget estimates included in the NASA request for FY 1997 reflect the estimates included in the President's budget request, and have not been adjusted by any group such as the Congressional Budget Office. The dollar levels in NASA's outyears indicate markers for a balanced budget path. They are a subset of the aggregate domestic discretionary levels and could be adjusted based on changes in other agencies' budgets. The specific dollar levels for NASA's programs will be considered in the course of future budget discussions.

QUESTION 7:

The science committee suggested through last year's authorization bill how one could get to their proposed budget numbers, particularly by reigning in such programs as MTPE. Such a stand was not popular in certain locations and among various legislators. But the Science committee made the difficult political decisions necessary to achieve the proposed budget figures, even if the administration will not do so. If station and MTPE remain insulated, is there any way to achieve the outyear budget targets without making considerably harsher budget decisions than have been made to date?

ANSWER 7:

The White House has instructed NASA to take no precipitous action on the outyear budgets. NASA is committed to working with OMB to reduce the deficit in the outyears, but NASA has received assurances that the Administration remains committed to retaining the vibrancy in NASA's core programs and where appropriate and necessary, providing funding for new starts. The dollar levels in NASA's outyears indicate markers for a balanced budget path. They are a subset of the aggregate domestic discretionary levels and could be adjusted based on changes in other agencies' budgets. The specific dollar levels for NASA's programs will be considered in the course of future budget discussions

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